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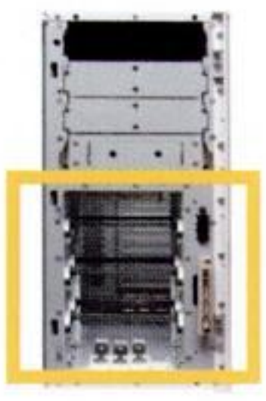

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Ed Word

Getting the Vista Vibe

Please send feedback and lemon curd to ***will@maximumpc.com.***

Over the last two months, I've spent at least a hundred hours using the latest beta of Windows Vista. The bad news is, Vista's left me more than a little underwhelmed.

When I preview a beta operating system (as in the Vista article on page 24), I try to reserve judgment on the OS as a whole. It's not fair to judge a beta operating system based on in-development performance, beta drivers, and a build that's gimped by debugging code. Instead, I detail the new features you'll see and prep you for your first experience with the new OS. Along the way, however, I'll make note of any problems I experience with the beta, things to check when I officially review the final code.

Normally, the most exciting time during an operating system's development is the month leading up to the first feature-complete build—the Release Candidate. You see, when the fledgling OS goes "RC," its list of new features is theoretically set in stone. Before that deadline, there's a mad dash to shoehorn in the last new features before it's too late, and the development team shifts to bug-hunt mode.

The builds leading up to that first RC are exciting for testers, too. It's the first time we see the features that get us psyched about the new OS. Unfortunately, with Vista, I don't see enough must-have features. Also, many of Vista's advances are available elsewhere. *Firefox* offers most of the functionality of *IE7*, Windows Gadgets offer little more than Yahoo's Widgets, and the integrated search functionality is only slightly better than desktop search engines you can download from Google or Microsoft for XP. The new Aero Glass interface is neat, but it's not exciting enough to compel consumers to upgrade. Vista just seems like an incremental upgrade, and not the revolution we hoped for.

Usually by the time the fledgling OS reaches this phase, it's begun to pull together into a cohesive, usable whole. Vista hasn't reached that point yet.

Thankfully, Microsoft has noticed the same problems, and has made the tough decision to delay the OS. Instead of further neutering Vista to ship in time for the critical holiday sales season, the development team will take a few extra months to polish Vista, delaying the launch from November til January.

I wouldn't be surprised if there are more delays, but I'm OK with that. I'm not happy with the current state of XP, but I've waited five long years for Vista. I'd rather wait a few months more than be stuck with a half-assed OS come January.

Will Smith

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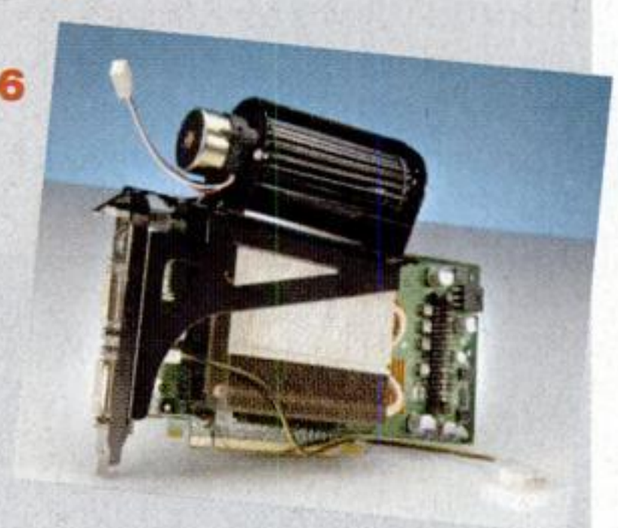
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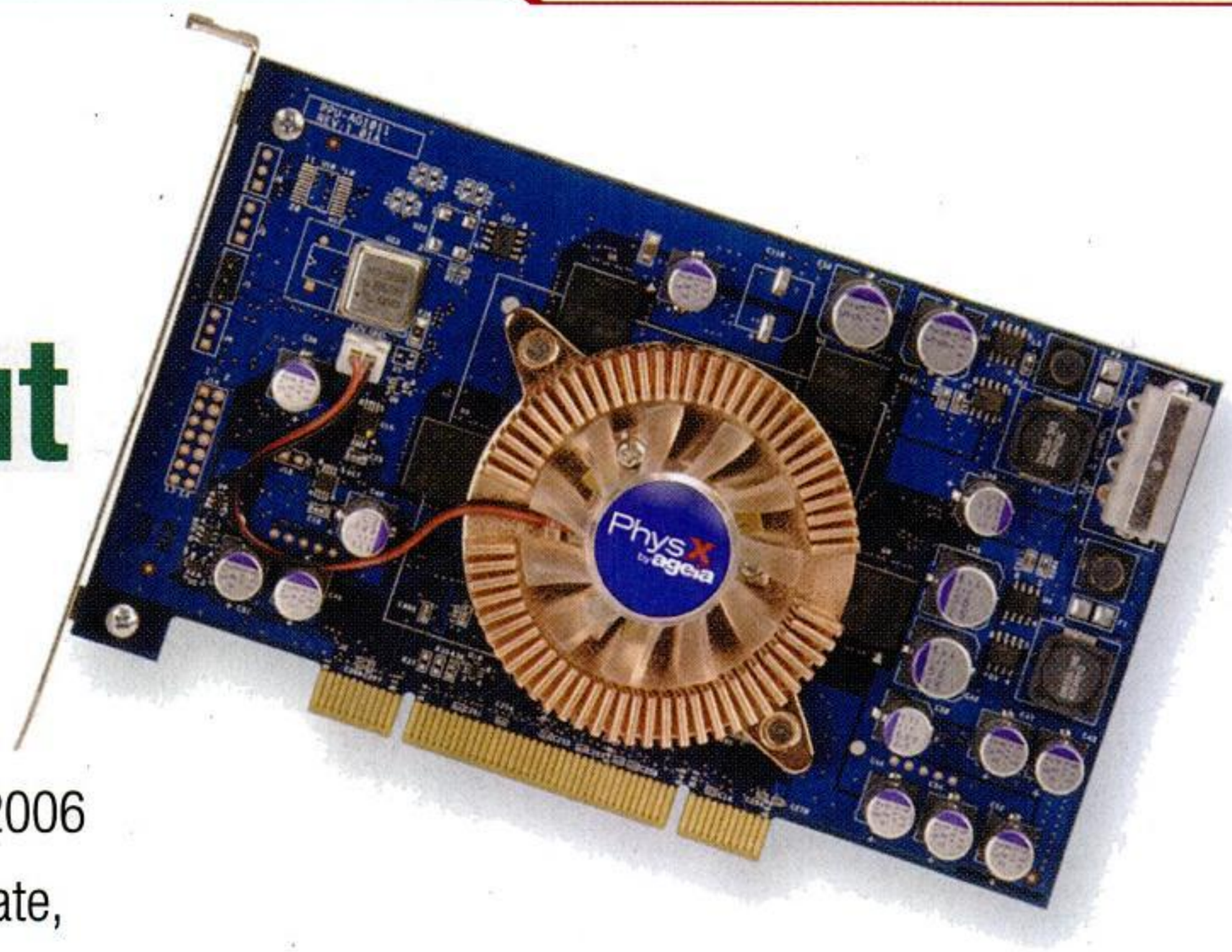
GDC 2006: It's All About Physics



Ageia (finally) launched its PhysX processor at this year's Game Developers Conference. The card will reportedly sell for $250 at retail.

If even half the seeds planted at the 2006 Game Developers Conference germinate, physics will be as important to tomorrow's games as 3D graphics are today

Physics acceleration was the hot topic at this year's Game Developers Conference. Intel and AMD were talking up the idea of running physics off a second or third CPU core in multicore systems. ATI and nVidia were pitching their high-end GPUs for the job. And Ageia, which makes the only dedicated physics accelerator—the PhysX chip—was claiming its card was the only chip for the job.

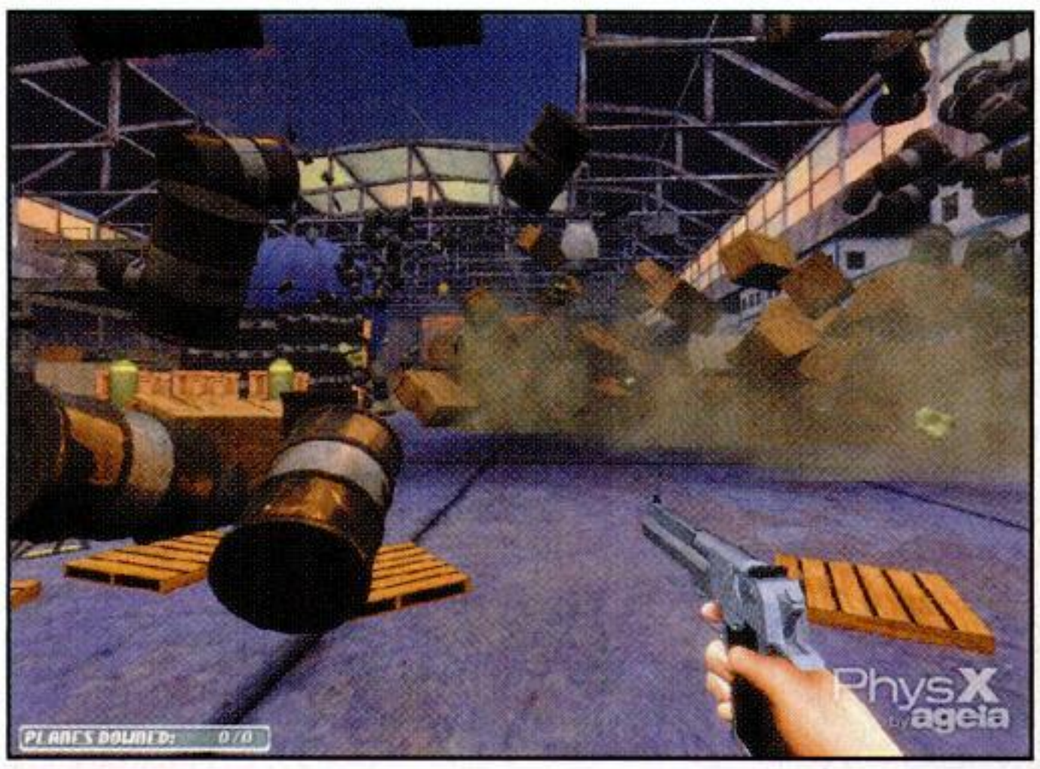
In addition to announcing that its long-awaited PhysX card was finally shipping, Aegia revealed that BFG Technologies had joined Asus in offering add-in boards. It was also announced that Dell, Alienware (now a division of Dell), and Falcon Northwest would begin selling rigs with PhysX boards. If all goes according to plan, upgraders and DIY system builders should be able to get their hands on an add-in card by the time you read this.

nVidia sought to rain on Aegia's parade by announcing an "exclusive co-marketing deal" with physics middleware-developer Havok—a purely paper arrangement of dubious value to consumers. Representatives from the two companies showed several fairly crude demos developed with Havok's *Havok FX* software running on two nVidia GeForce 7900 GTs in SLI. This left ATI in the unenviable position of screening closed-door *PowerPoint* presentations of its GPU doing physics. ATI originally mentioned the notion of using a GPU for physics processing in October, at the launch of the X1000 series.

nVidia's deal with Havok was a shrewd move, because it created the impression that *Havok FX* would work only with nVidia hardware. In reality, *Havok FX* will work with any Shader Model 3.0-class GPU, including any of ATI's X1000 parts. What's more, the middleware doesn't rely on the type of high-speed GPU-to-GPU communication that SLI—or CrossFire, for that matter—requires. Theoretically speaking, you could upgrade your videocard, leave the old one in the box, and dedicate it to physics processing.

Naturally, ATI and nVidia are claiming each others' technology isn't suited to physics acceleration. For example, ATI has stated that its X1000 series of cards are superior because they're capable of more granular branching (compared with nVidia's card). However, Nick Stam, nVidia's director of technical marketing, told journalists at GDC that ATI's decision to build such a complex GPU was foolish, saying the cost of "...adding those features is too high for a minimal performance return in today's apps and even for upcoming apps."

So which component—CPU, GPU, or PPU—is best suited for physics? It's going to take a little time and a bunch of benchmark testing before anyone can authoritatively say, but we'll have an answer very soon.



Ageia showed a few custom-made game demos running its PhysX accelerator, and the results were impressive. Whether its performance will be as impressive in shipping titles remains to be seen.

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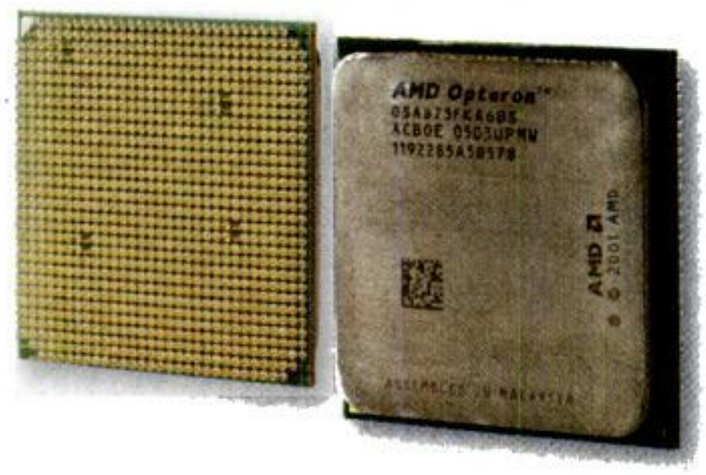
Quad Cores Are on the Way!

Four core and five years ago…

Our 2005 Dream Machine (aka DMX) sported two dual-core CPUs—for a total of four cores—and it was bad to the bone. Many readers coveted our quad-core rig, and we can't blame 'em. The good news is that in 2007, quad-core CPUs are coming to the desktop (finally).

According to a report in *Digitimes*, both AMD and Intel are prepping quad-core CPUs for release in Q1 of 2007. Intel's processor is code-named Kentfield and will be manufactured on a 65nm process using the company's new Conroe microarchitecture. AMD's new processor will be christened K8L, and will be a Socket AM2 part manufactured with a 90nm process.



Preview

Intel's Flashy New Technology

If Intel has its way, we'll all soon be running onboard memory—on our motherboards

Windows Vista will support hybrid hard drives, which augment traditional platter storage with onboard flash memory. This small cache of non-volatile memory will reportedly allow massive speed increases while consuming significantly less power. The problem is that Microsoft is dependent on drive manufacturers to make the drives, and cost issues could be a deterrent. Intel has devised a workaround of sorts—adding flash memory directly to the motherboard chipset.

Dubbed Robson, Intel's "platform acceleration technology" could consist of either a fixed amount of memory or an upgradeable socket. The benefit of Robson would be improved hard drive performance, without requiring a special hybrid design. It should perform like Windows' Prefetch, placing commonly accessed files and boot files in the cache, for quick access. Robson could also allow drives to remain spun down, cutting down on noise and heat, and saving energy. Intel is reportedly readying Robson for a Q3 release alongside its new Conroe CPU.

TOM **HALFHILL**

Intel's Core is a Brainiac

Big brains or fast feet? Those are the two broad choices for CPU architects. Some processors achieve high performance by using extra-complex logic. Others use simpler logic to race through calculations at faster clock speeds. Either approach works, but sometimes technology dictates which method is better at a point in time.

This time, Intel is betting on the "big brains" approach. Intel's new microarchitecture, named Core, is the foundation for new x86 processors coming in mid-2006 and beyond. Don't confuse it with today's Core Duo processors, which use the older Banias (Pentium M) microarchitecture. Although the Core microarchitecture is based on Banias, it's a fresh design not found in existing chips.

Core follows the "brainiac" philosophy. Brainiacs are complex processors that run at slower clock frequencies but perform more math than other speed-demon processors. Intel's previous NetBurst microarchitecture was a speed demon. Its 31-stage instruction pipeline was the deepest ever seen in a general-purpose processor. Deeper pipelines enable higher clock speeds, but NetBurst sprinted into the brick wall of power dissipation.

By contrast, Core has a 14-stage pipeline. That's still pretty deep, so Core processors won't be slugs. And Intel has compensated by adding more pipelines, widening some datapaths, and making other improvements. NetBurst was a three-way superscalar design, whereas Core is a four-way machine. Core has 128-bit wide datapaths for floating-point and multimedia instructions, whereas NetBurst had 64-bit-wide datapaths. Core's additional complexity delivers higher performance at lower clock frequencies.

Core's four-way superscalar design is a little surprising. Executing four program instructions per clock cycle is a relatively rare event. Most superscalar processors struggle to average more than 1.5 instructions per cycle. However, the wider floating-point and multimedia datapaths should measurably improve gaming performance, which is critically important for home PCs. Intel has also dropped Hyper-Threading for now, but it will probably resurface in a future processor.

Overall, the Core microarchitecture makes intelligent trade-offs and paves the way for Intel to build multicore processors with two, four, or even eight cores in the near future. It also pressures AMD to do something marvelous with its own revised microarchitecture, expected this summer.

Tom Halfhill was formerly a senior editor for Byte magazine and is now an analyst for Microprocessor Report.

GAME THEORY

THOMAS MCDONALD

The Future of PC Gaming, Part II

The phrase "Consoles are Better" is on the short list of verboten opinions at any PC magazine, and certainly not one I would have voiced a few years ago. I'm a PC gamer through and through, down to the bone. I didn't have a hardcore console childhood and then drift into computer gaming as I grew older. I began gaming on computers such as the TRS-80 and Commodore 64.

But tell me: Did the C64 plug into a computer monitor on a desktop? No, it plugged into your TV and you sat on the living room floor. My first desktop PC was an 8088 with a black-and-yellow Hercules monitor, and it didn't even have a mouse until I added a special mouse board. A bus mouse was exotic hardware, partner.

So when I say the future of PC gaming is in the living room and not on the desktop, I'm not talking heresy. I'm talking about a return to our roots. The Xbox 360, with its Windows Media Center OS and PowerPC core, doesn't feel like a typical game machine. It feels like a proto-PC that connects to the TV. And because it's capable of streaming media, can connect to the Internet, and of course, play games, it certainly feels like a PC. But it's certainly not a full PC yet.

The lack of keyboard/mouse control is a major handicap, but the low player cap for certain Xbox Live games (*Call of Duty 2* is limited to eight players) is an even bigger hurdle.

More to the point for gamers, however, is the promise that the distinction between a PC game and an Xbox game will vanish at some point in the next generation. Let's face it: The PC gaming market is not as vibrant as it once was. PC gamers are more likely to get solid titles for their desktop PCs if games can be PC/Xbox hybrids right out of the box. The 360 isn't the machine to do that, but it points the way toward a true home-entertainment/PC convergence where the standard desktop/console distinctions fall away, and everyone benefits.

Tom McDonald has been covering games for countless magazines and newspapers for 11 years. He lives in the New Jersey Pine Barrens.

AMD Takes on Viiv with Live!

You've probably heard of Intel's home-theater PC (HTPC) platform called Viiv. Now AMD has announced its own HTPC spec named Live (funny how the two names rhyme). Though Live specifies the hardware required for systems to qualify (just like Intel's initiative), AMD will also deliver software to "enhance the entertainment experiences by extending the power and flexibility of your PC." (We're not sure what that means, either.) Unlike Intel, AMD isn't tying its initiative to a specific chipset. Find out more at http://amdlive.amd.com/.

AMD 64 LIVE!™

And We'll Call it Dellienware

In a surprising move, Dell buys Alienware but keeps details secret

The latest technology mashup almost reads like a new Must See TV show: Can an uptight, business-type share an apartment with a pizza-eating, tattoo-covered gamer?

With Dell owning Alienware, the company will have a backdoor option to sell AMD-based PCs bearing the Alienware logo, without sacrificing its presumed preferential treatment from Intel.

DELLIENWARE

That sums up the unlikely pairing of the world's largest PC maker Dell and straight-from-the-gaming-'hood Alienware. Unlike Hewlett-Packard's clumsy attempt to eat Compaq several years ago, Dell says it will keep Alienware as a completely separate entity, but will leverage economies of scale to help lower Alienware's costs.

Alienware's 2005 revenue was reportedly $177 million with a forecast of $250 million for the next fiscal year, which would make it the largest boutique PC builder in terms of revenue. Yet Alienware's purchase price amounted to less than a single day of Dell's revenue, Michael Dell told *Fortune* magazine.

Add-In Board Promises Lag Reduction

A new company is promising to reduce lag in online games, with the world's first Gaming Network Processor (GNP). No, we're not joking. Bigfoot Networks, founded by former Intel networking guru Harlan Beverly, has a patent pending on its all-new lag-ending tech, dubbed Lag and Latency Reduction (LLR).

The company plans to offer an add-in board that will reportedly offload networking chores from the CPU, thereby boosting frames-per-second and reducing lag time in online games, via client-side optimizations. The company hasn't stated specifically how its card works, claiming that revealing the information would compromise trade secrets. We're intrigued, but very skeptical of anything that sounds too good to be true. Investigate it yourself at **www.bigfootnetworks.com.**

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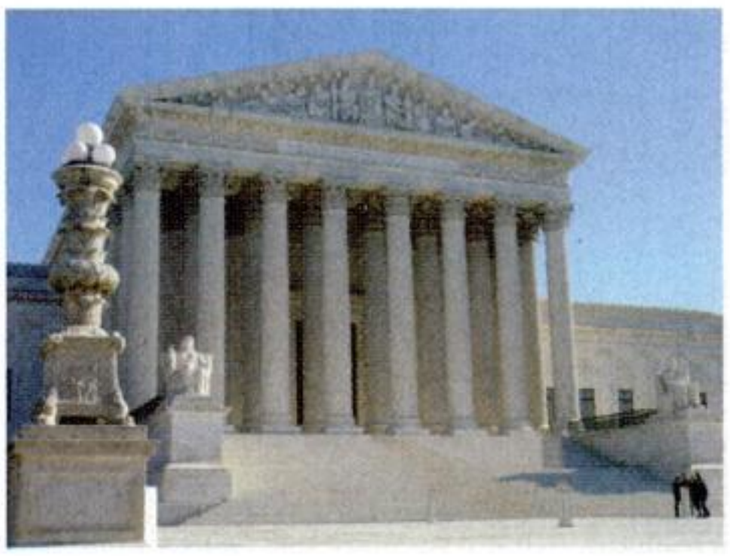


Starforce copy-protection is wildly unpopular, but is it illegal? That question will be before the court soon.

Ubisoft Sued over Starforce

A class-action lawsuit has been filed against game publisher Ubisoft over its use of the controversial copy-protection software *Starforce*. The *Starforce* software has been accused of everything from destroying optical drives to impregnating gamers with two-headed offspring.

The $5 million suit claims *Starforce* creates security holes in a system, installs without permission, and is not easily removed.

Memorex FlashDiscs

Memorex's FlashDiscs are merely USB keys dressed up in the guise of a disc. Memorex boasts that its FlashDiscs offer users a high-density alternative to the floppy disc. Uh, hello? Any storage device these days is a high-density alternative to the archaic floppy.

Sold in packs of three, the FlashDiscs sport a lowly 16MB storage capacity, for a whopping $20. Adding insult to injury, their bulbous shape makes it damn near impossible to plug other USB devices into adjacent ports. For throwaway data, we'd rather use a $0.25 CD-R.

$20 for a pack of three, www.memorex.com

Pirates vs. MPAA, Round 19

The entertainment industry has all but won its war against P2P software such as *Grokster*, *Morpheus*, and *Kazaa*, so now it's BitTorrent's turn to go up against The Man in court. Of course, because you can't sue BitTorrent (it's just a technology), and you can't sue the users directly (they all operate independently), the MPAA is going after search engines that point to files for people to download.

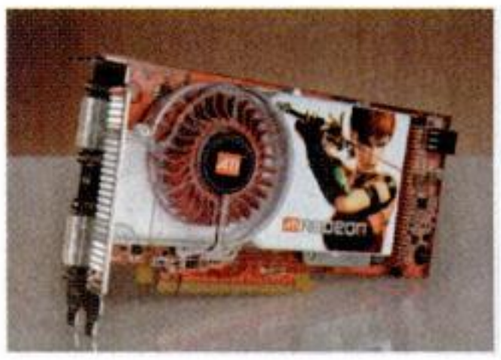
Recently, some of the biggest torrent search engines, including Torrentspy.com and Isohunt.com, were sued by the MPAA. Rather than shutting down immediately, like some other popular tracking sites, these sites are putting up a fight. The outcome of the altercation will weigh heavily on the future of legal and illegal online file trading.

The gist of the MPAA's lawsuit is that the sites are engaging in piracy by providing links that point to the illicit material. The defendants' response is to point to none other than the infamous Grokster case, where the U.S. Supreme Court ruled that file-sharing networks can be held liable for copyright infringement if they take "affirmative steps" to encourage infringement. The BitTorrent search engines claim they're just running a search engine, and don't take any steps to actively encourage copyright infringement. Torrentspy.com has even filed a motion to dismiss the suit against it, claiming it's just a search engine similar to Google, and can't be held responsible for what people are searching for or what they do with the files once found.

FUNSIZENEWS

ATI WARMS UP TO OVERCLOCKING

ATI has never allowed its add-in board sellers to overclock the company's GPUs from the factory in the past, but that's all changed with the company's X1000 series of boards. ATI is now reportedly encouraging resellers to overclock its chips, according to internal memos. ATI noted, however, that any RMAs resulting from overclocking will be the responsibility of the vendor, not ATI.



MICROSOFT THROWS IN THE SPYWARE TOWEL

Microsoft has all but given up on trying to fight malware. In an article in *eWeek*, a Microsoft security guru states that the best way to solve malware issues is to wipe the drive and reformat. "Detection is difficult, and remediation is often impossible," he said.

SKYPE IN TROUBLE

VOIP provider Skype is facing a huge lawsuit from long-time rival Streamcast networks, maker of the once-popular *Morpheus* P2P software (*Morpheus* competes with *Kazaa*, which was developed by Skype's founders). Streamcast has filed a complaint requesting $4.1 billion dollars in damages from Skype, though it has not filed an actual lawsuit yet. Steamcast claims Skype stole its core technology from the company, a claim Skype vigorously denies.

APPLE CRANKS IT DOWN

Apple has released an iPod firmware update that lets users lower the maximum volume of the device from the "holy crap" default of 130 decibels to a less-deafening 100dB. The move by Apple comes as numerous reports show that listening to MP3 players at high volume can damage your hearing. Apple also faces a class-action lawsuit for not warning people of the dangers of loud music. Thank goodness, someone's finally letting us know that extreme volumes could damage our hearing.

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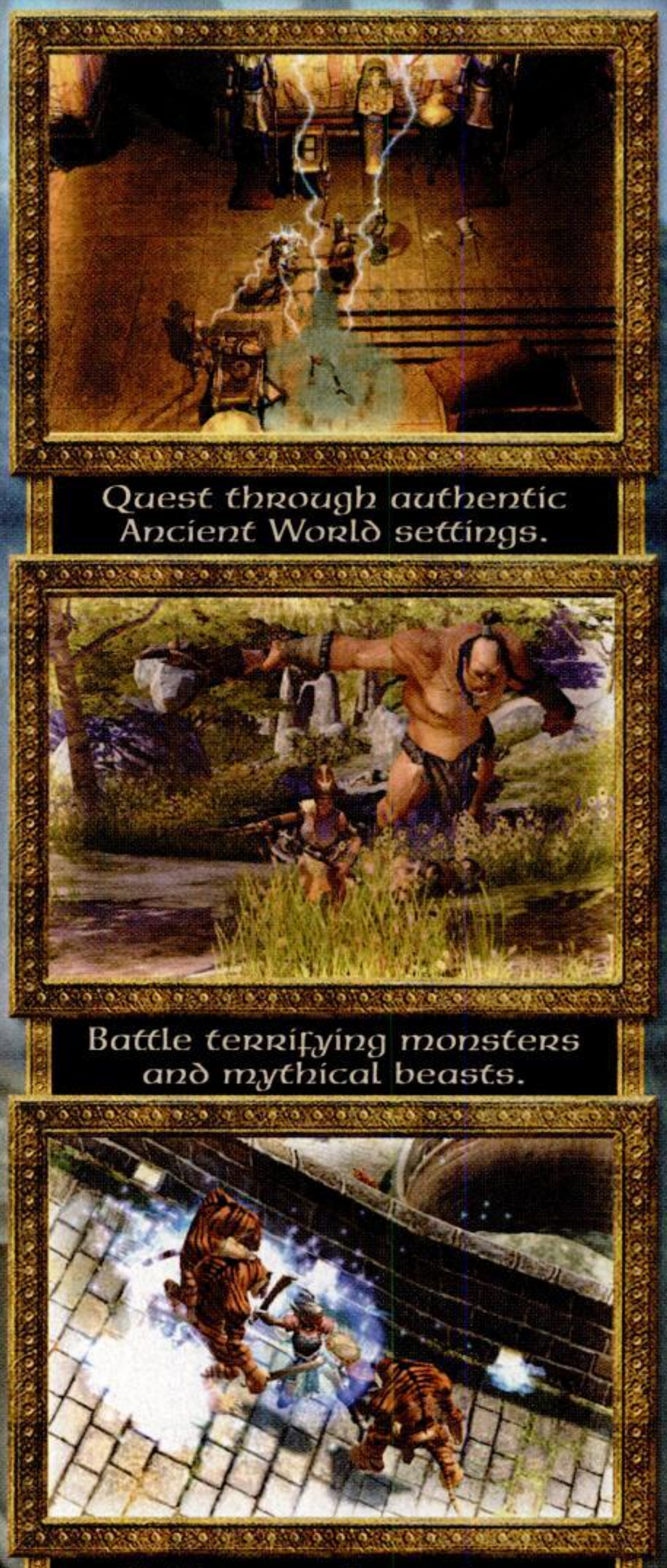

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WINDOWS MOBILE 5.0

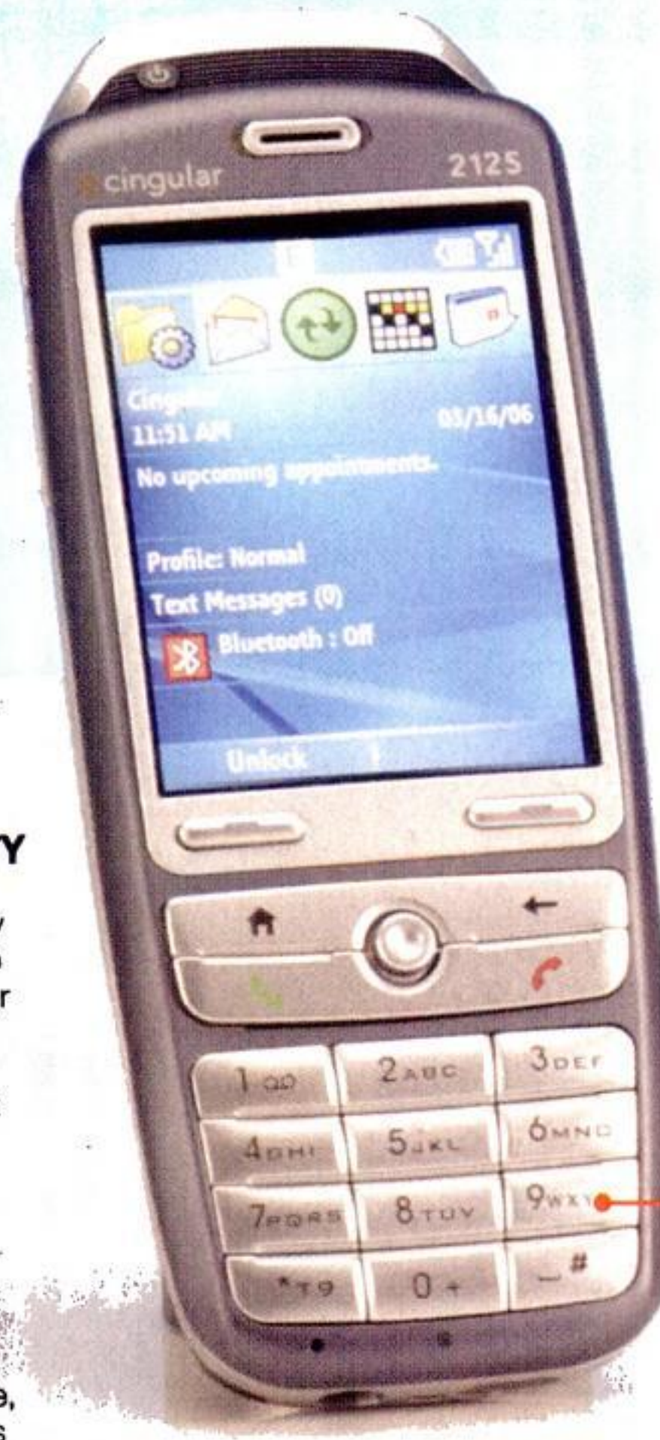
Smartphone **vs.** PDA Phone

Back in the day, we liked toting around a full-fledged PDA—it was like having a lightweight computer in our pocket. But the benefits came at a price: As PDAs got more powerful, battery life shortened, and the devices themselves went from thin and light to big and clunky. And now, with everyone carrying a cellphone, the PDA's popularity is even more jeopardized. No one wants to carry both a cellphone and PDA if they can help it. Thus the advent of PDAs with built-in phone functionality.

But there's another option: smartphones. Falling somewhere between a PDA and a normal cellphone, the latest smartphones offer lots of PDA functionality in a much more convenient formfactor. A five-way digital pad and a streamlined interface take the place of the PDA's touch screen, with surprisingly satisfying results.

Which is better for you? To find out, we spent a couple weeks using two Windows Mobile 5.0-powered devices: the Cingular 2125 Smartphone and the Cingular 8125 Pocket PC PDA Phone. They're made by the same company, use the same carrier, and are fairly good representatives of their respective categories. Here's the detailed breakdown.

BY WILL **SMITH**



round 1

PHONE FUNCTIONALITY

One of our main complaints about the Treo and Blackberry is that while it's really handy to have a phone attached to your PDA/email device, the phone functionality is a secondary feature. A PDA phone doesn't have buttons, so it's virtually impossible to dial a number without looking at the screen. Furthermore, a PDA phone lacks basic amenities that we expect from cellphones, like profiles for "silent" or "vibrate-only" operation. A smartphone, however, is a super-phone. It's easy to dial without looking at the screen, it's small enough to fit in a jeans pocket, and we *love* the tight integration of the dialer and address book. With every entered digit of a number, or letter of a person's name, the phone presents a shrinking list of possible contacts for you to choose from.

WINNER: SMARTPHONE

round 2

USABILITY

We've already talked about the issues the Pocket PC phone has with the included keyboard, but we need to discuss the user interface (UI). Nearly everything you do with the phone requires you to use the touch screen, either by mashing it with your meaty fingertip, or by whipping out the stylus, then navigating through a series of menus. By contrast, a smartphone's entire user interface is easily accessible using the D-pad. Whether we were browsing the Internet, checking email, or just looking up tomorrow's appointments, it was an easy, one-handed operation with the smartphone.

WINNER: SMARTPHONE

SMARTPHONE: CINGULAR 2125,
www.cingular.com, $300 sans contract

round 3

PDA FUNCTIONALITY

This is a much tougher category to judge. Both phones sync seamlessly with *Outlook* using ActiveSync, so it's a snap to keep all your contact and calendar info up to date. The Pocket PC phone has a slight advantage, because you can run nearly any application designed for a plain PDA on the phone; the smartphone only works with apps that don't require a touch screen.

The touch screen and full QWERTY keyboard should make it easier to enter data on the Pocket PC phone, but a really stupid design decision renders that advantage null. Until you begin typing, there's no indication whether the keyboard is in cap-lock or symbol-lock mode. It sounds like a minor problem, until you bang out a few full messages in nothing but #&$*37/. While the smartphone delivers as much functionality as we need, it's by no means a full-featured PDA.

WINNER: PDA PHONE

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round 4 BATTERY LIFE AND SCREEN

Surprisingly, we didn't have any complaints with either device's battery life—at least as long as we left the Pocket PC phone's integrated Wi-Fi adapter disabled. The Pocket PC phone lasted three full days without a charge during normal use, while the smartphone made it to four; both phones charge (and sync) using a standard four-pin mini-USB connector.

The screens on these two devices are remarkable. Both sport resolutions of 320x240, although the Pocket PC phone's screen is a touch larger (2.2-inches versus 2.8-inches). Colors are great, and both scale reasonably well.

WINNER: SMARTPHONE

round 5 INTERNET AND EMAIL

When you're used to browsing the Internet on a high-resolution display, moving to a tiny portable screen can be a shock. So it's not much of a surprise that neither of these devices is great for web browsing, but they both work very well with many of the online RSS aggregator services. Email and IM are a different story, however.

While the smartphone fared relatively well for our calendar and address book, its telephone keypad just doesn't cut it for writing emails of more than a few words. Sure, the PDA phone's keyboard is annoying, but it's still better than using the smartphone's T9 pad. We experienced a few hiccups with Cingular's Xpress Mail service using both phones—neither was as easy to configure as a Blackberry.

For instant messaging, the smartphone's keypad isn't as much of a weakness, because we're less concerned about pesky punctuation and capitalization rules. Still, this category has to go to the PDA phone.

WINNER: PDA PHONE

PDA PHONE: CINGULAR 8125,
www.cingular.com, $350 sans contract

And the Winner Is...

It's worth noting some of the nifty features these phones have in common: The high-speed EDGE cellular data service kicks ass. It won't be confused with a broadband connection, but browsing and always-on access for email and IM are very handy. Both phones also let you install a 1GB MiniSD card to store documents, applications, or media files. You can even save photos and video directly to the card with the phones' integrated 1.3-megapixel cameras.

Still, the clear winner is Windows Mobile 5.0 Smartphone. It offers a great balance of convenient size and the core functionality we demand from a PDA. Sure, the smartphone is incapable of fancy handwriting recognition and is more limited than a full-fledged PDA, but we love the simple interface, easy access to key information, and the fact that this smartphone is a good phone first, rather than a PDA with a phone soldered onto it. We're very impressed.

Nevertheless, there's definitely a place for PDA phones. Although Cingular's push email service has some bugs, the keyboard and touch screen combo gives you a versatile device in a belt-friendly formfactor. It gives PDA addicts an opportunity to lighten their load by ditching their cellphones. MPC

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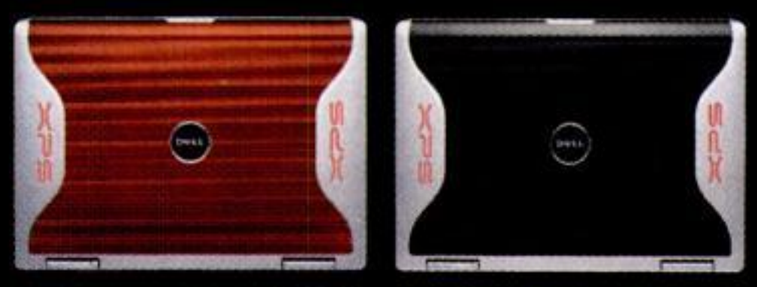

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Ben, Watchdog of the month

Our consumer advocate investigates...

✓Western Digital ✓Invisible IP ✓Totally Awesome ✓Electro Source

SHAME ON THE DOG

Set your phasers on Safe, laddies. The Dog incorrectly quoted the great Montgomery Scott in his April column. What Scotty actually said in episode 32 was "Fool me once, shame on you. Fool me twice, shame on *me*." And shame on the editors who missed that mistake.

HOW DO YOU DEFINE 1GB?

The Dog didn't think suing hard drive makers over the definition of 1GB was really kosher, but Western Digital has agreed to settle a class-action lawsuit claiming that consumers got shafted on capacity. The problem? While operating systems represent 1GB using a binary definition of 1,073,741,824 bytes, hard drive makers—including Western Digital—use the decimal definition of 1,000,000,000.

Anyone who purchased an aftermarket WD drive between March 22, 2001 and February 15, 2006 are members of the class, and are entitled to download a copy of EMC *Dantz Retrospect Express version 7.0* backup software. Attorneys in the case, however, are the real winners, netting $485,000 plus $15,000 in expenses. More information is available at www.wdc.com/settlement.

INVISIBLE VENDOR

I've read almost every edition of your magazine and pride myself on having never been duped. That all changed recently when I visited a site called InvisibleIP.com. The entire website is devoted to a tool for anonymous web surfing. What I ended up purchasing for $19.95, however, was a spyware scanner called ***ETD Security Scanner****. It tells me I have all types of spyware on my computer, which none of the top-five spyware scanners, including the* ***Panda*** *free scanner, could find. I have since uninstalled the program and requested a refund, which I really don't expect to receive anytime soon. After purchasing the product and learning its real name, I was able to discover information about it at* ***www.spywarewarrior.com/rogue_anti-spyware.htm#products.***

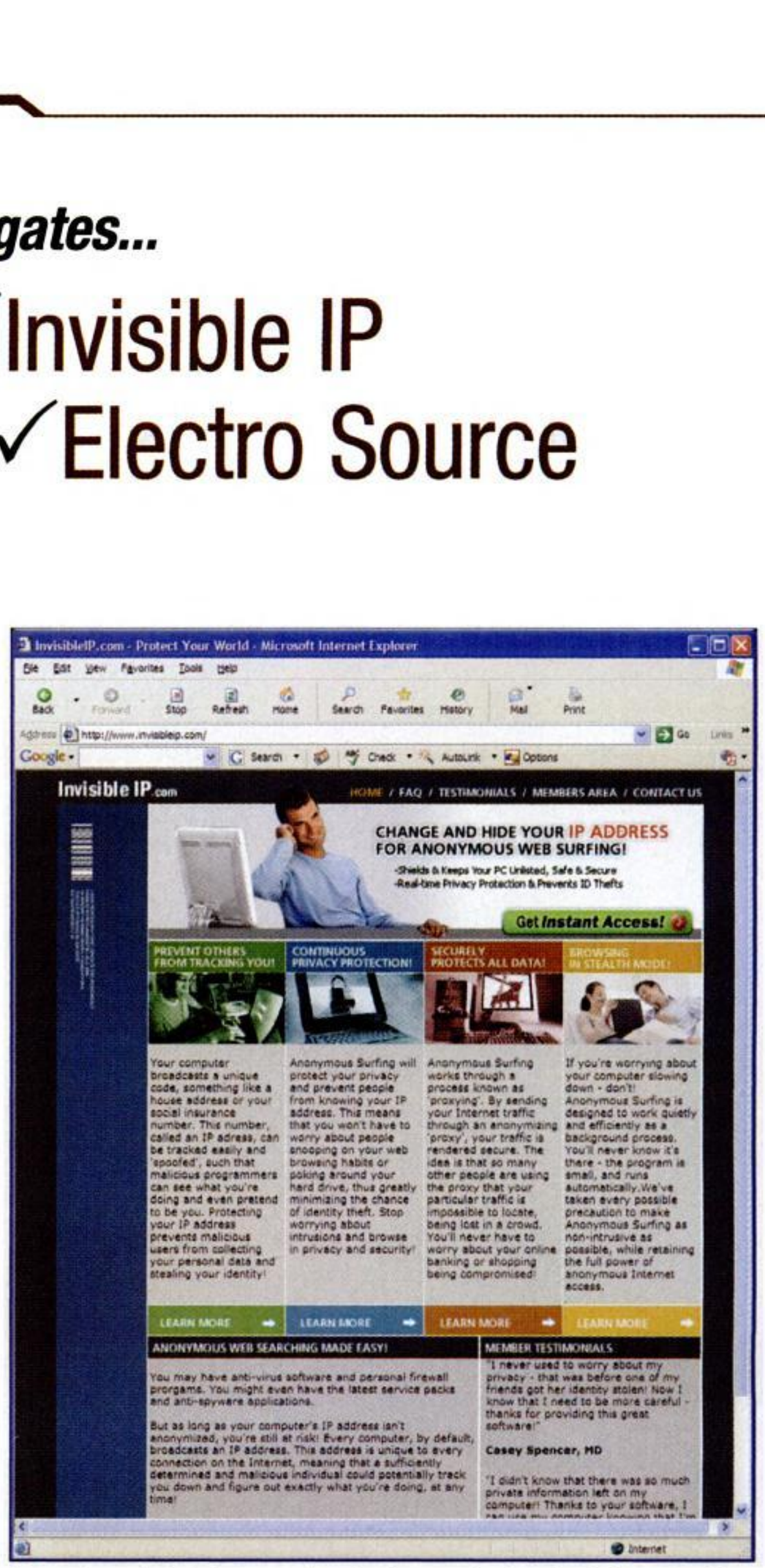
— Dane Chung

Indeed, there's no other way to know the true nature of InvisibleIP.com's product, with its claim to "change and hide your IP address for anonymous web surfing!" What else was Dane to think, given testimonials from customers such as Casey Spencer, who's quoted as saying: "I never used to worry about my privacy—that was before one of my friends got her identity stolen! Now I know that I need to be more careful—thanks for providing this great software!"

When the Dog tried to contact InvisibleIP.com for comment, no one responded. The website is hosted on GoDaddy.com but registered through DomainsByProxy.com.

DomainsByProxy.com masks who actually registered the site, so it's anyone's guess who owns it. Interestingly, DomainsByProxy.com has two prominent links on its front page: one for law enforcement to conduct investigations of its members, and the other for serving civil subpoenas, so you gotta wonder what's going on.

Because InvisibleIP.com never responded, the Dog is putting the site into the Dog House, with much pleasure. If you're looking for a legitimate surfing tool that provides anonymity, there's still *Anonymizer* (www.anonymizer.com). You can try *Anonymizer* for free by entering URLs you want to surf anonymously into the Anonymizer home page.



A reader claims he received adware instead of the stealth-surfing software he was led to believe he was purchasing.

TOTALLY OUT OF BUSINESS

I don't know if you've heard, but Totally Awesome Computers shut down eight stores in Utah this week. I know this might not seem like a big deal, but its website is still running, and anyone buying a computer from Totally Awesome will be getting a totally awesome amount of grief with their purchase. I believe ***Maximum PC*** *reviewed one of its computers before, so: Buyer, beware!*

— Roger Price

Don't worry, Roger; Totally Awesome's website has since been updated to reflect its defunct status, there's no risk of attracting unwitting new customers. TAC's existing customers and 70 employees aren't as lucky.

What did in TAC? It's not clear, as the company's "colorful" owner, Dell Schanze—aka Super Dell—hasn't disclosed any details. He did, however, hold a press conference, during which he blamed the media.

"It's too bad that all of the media in Utah are liars and murderers," the Deseret News quoted

Got a bone to pick with a vendor? Been spiked by a fly-by-night operation? Sic The Dog on them by writing **watchdog@maximumpc.com.** The Dog promises to answer as many letters as possible, but only has four paws to work with.

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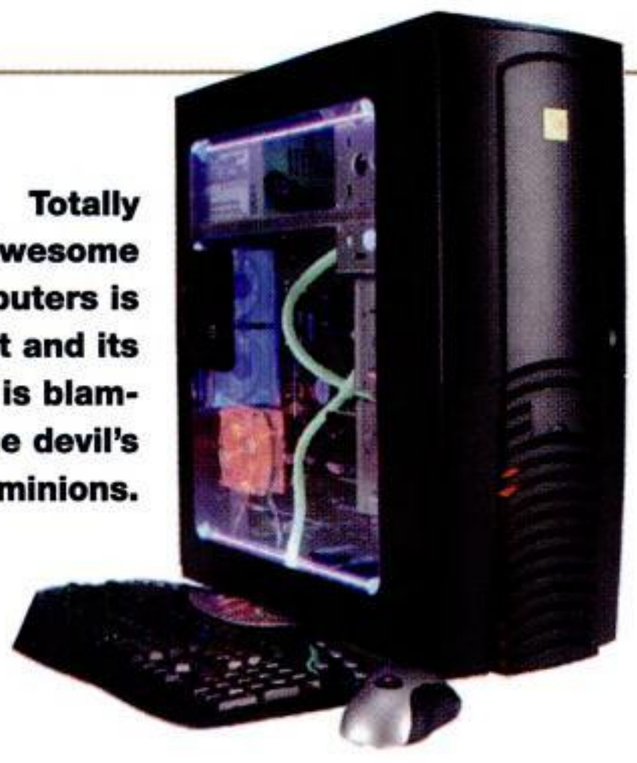


Totally Awesome Computers is kaput and its owner is blaming the devil's minions.

Super Dell as saying. "You just destroyed the greatest computer company of all time. We were the best in the world, the world champion. All this hatred was created by you. You're basically angels of Satan. All I can say to the people in Utah is, please pray for all the news people."

Schanze was known locally for his annoying but memorable commercials, but he had recently gotten into some hot water. Totally Awesome and Schanze were the target of lawsuits alleging religious and racial discrimination. Most were settled out of court. The company had also been undergoing an IRS audit.

Schanze himself is still facing charges of reckless driving, threatening to use a weapon, and making false statements to the police. Neighbors apparently chased down Schanze after he allegedly drove through the area at high speeds while children were present, according to news reports. The neighbors allege Schanze pulled a 10mm Glock on them after they confronted him about the speeding. Schanze described the neighbors as "vigilantes" and initially said he had to pull his gun to defend himself and his daughter from one of the neighbors who threatened to throw a rock at his car.

Schanze once started an ad campaign against the mayor of Provo, Utah, claiming the city was wasting money on computer systems purchased from another company, according to a story in the Deseret News. In ads, Schanze offered to give the mayor his own $80,000 Jaguar if it could be proved that the systems the city purchased from IBM were better than Totally Awesome's. The only problem was that Totally Awesome hadn't submitted a bid with the rest of the vendors for the city contract.

Totally Awesome's customers are totally out of luck. Local-outfit PC Laptops said it would pick up the warranties for Totally Awesome's customers for three months.

BAD PIXELS REDUX

In January, when my Nikon CoolPix 5700 went berserk and developed a green halo and streaky images, I thought I was plain out of luck—it was out of warranty and too costly to repair. But when I read the May issue, I was astonished to see that the Watchdog reported my problem as a common defect, and I was delighted to learn that most of the manufacturers were fixing it for free. As you so aptly noted, Nikon, who emails me regularly with other offers, never bothered to contact me about this problem. If not for your magazine, I wouldn't have known about this. Today, I'm shipping off what I thought was a useless paperweight, for repairs. Fortunately, I had not bought another camera yet!

—Steven M. Kornblau

The Dog is glad to hear that Nikon did the right thing, but he still feels that the camera companies are not doing enough to inform consumers about a defect afflicting millions of cameras made by Sony, Nikon, Canon, Pentax, Olympus, Fuji, Konica Minolta, and Ricoh. If you have a camera or camcorder from one of the above vendors, that was manufactured between 2002 and 2004, and that's displaying a splotchy or streaked image and/or green halos, the Dog encourages you to research the possibility that it has a defective CCD. The easiest way to catch up on this issue is to visit www.imaging-resource.com and look for the entry under Digital Camera Service Advisories. MPC

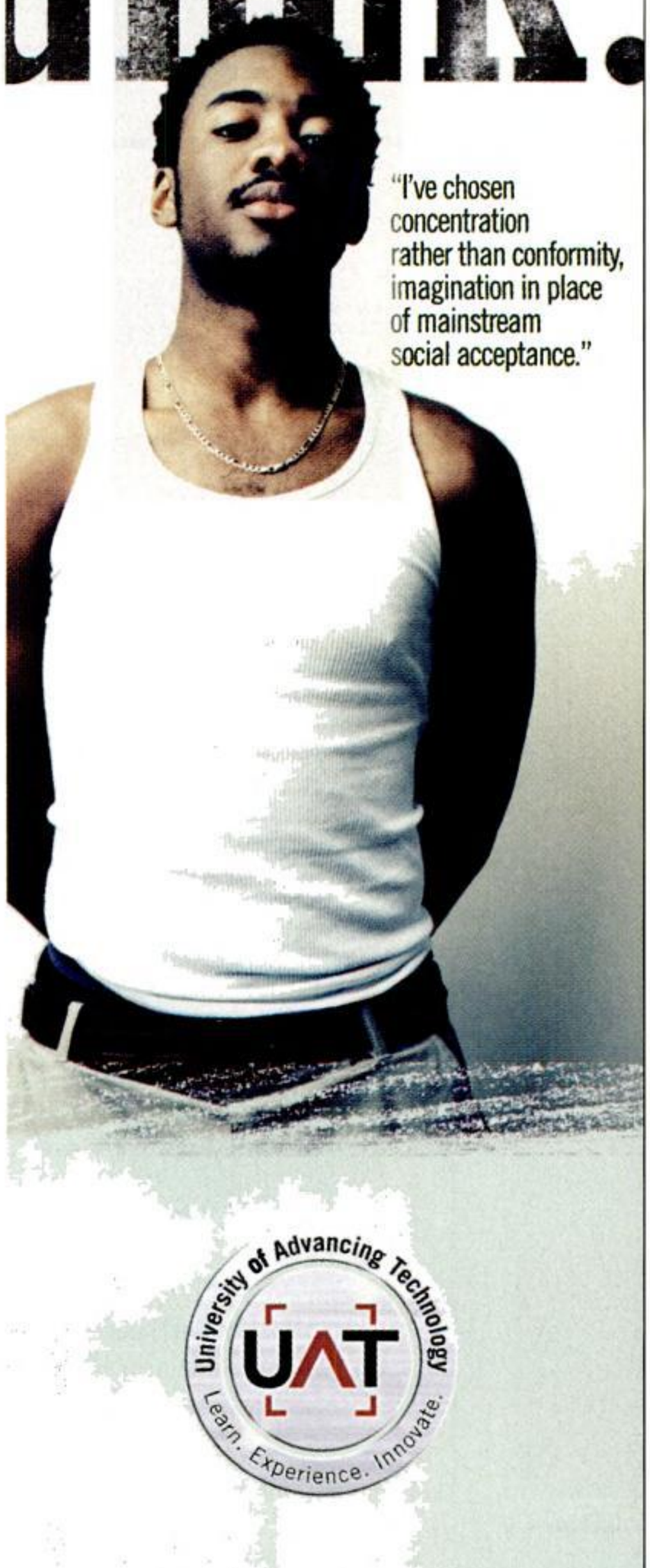
Recall Alert

Electro Source is recalling about 230,000 power bricks that could overheat.

Electro Source is recalling some 231,000 Pelican Power Brick Battery Chargers for the Sony PSP that could overheat and post a fire and burn hazard. The company said it has received 143 reports of the recalled battery charger overheating, with one report of fire damage. No injuries have been reported.

The Pelican Power Brick contains two lithium-ion batteries and is used to recharge or power the Sony's PlayStation Portable. The model number of the charger is PL-6018 and was sold between April 2005 and March 2006. Consumers are asked to immediately stop using the brick and to contact Electro Source at 800-263-1156 or www.powerbrickrecall.net. Consumers will not receive a new power brick, but Electro is offering "a choice of several attractive replacement products instead."

I'M A GEEK.



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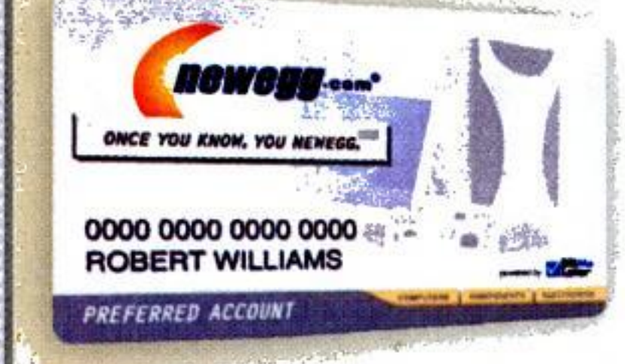

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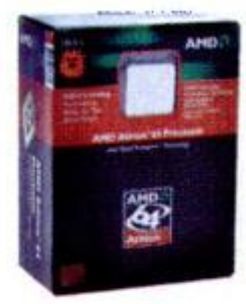

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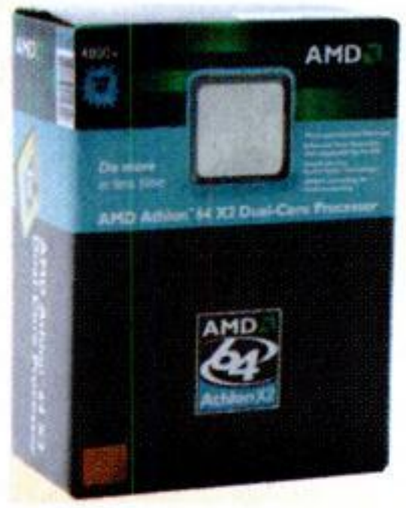

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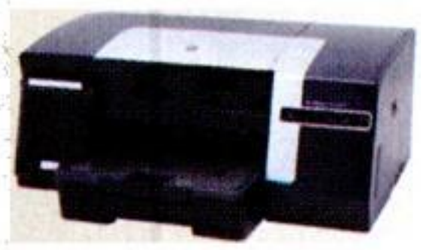

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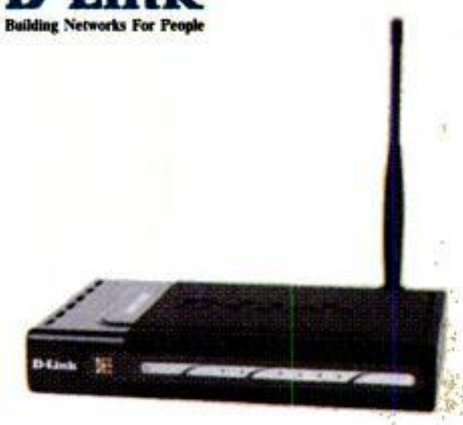

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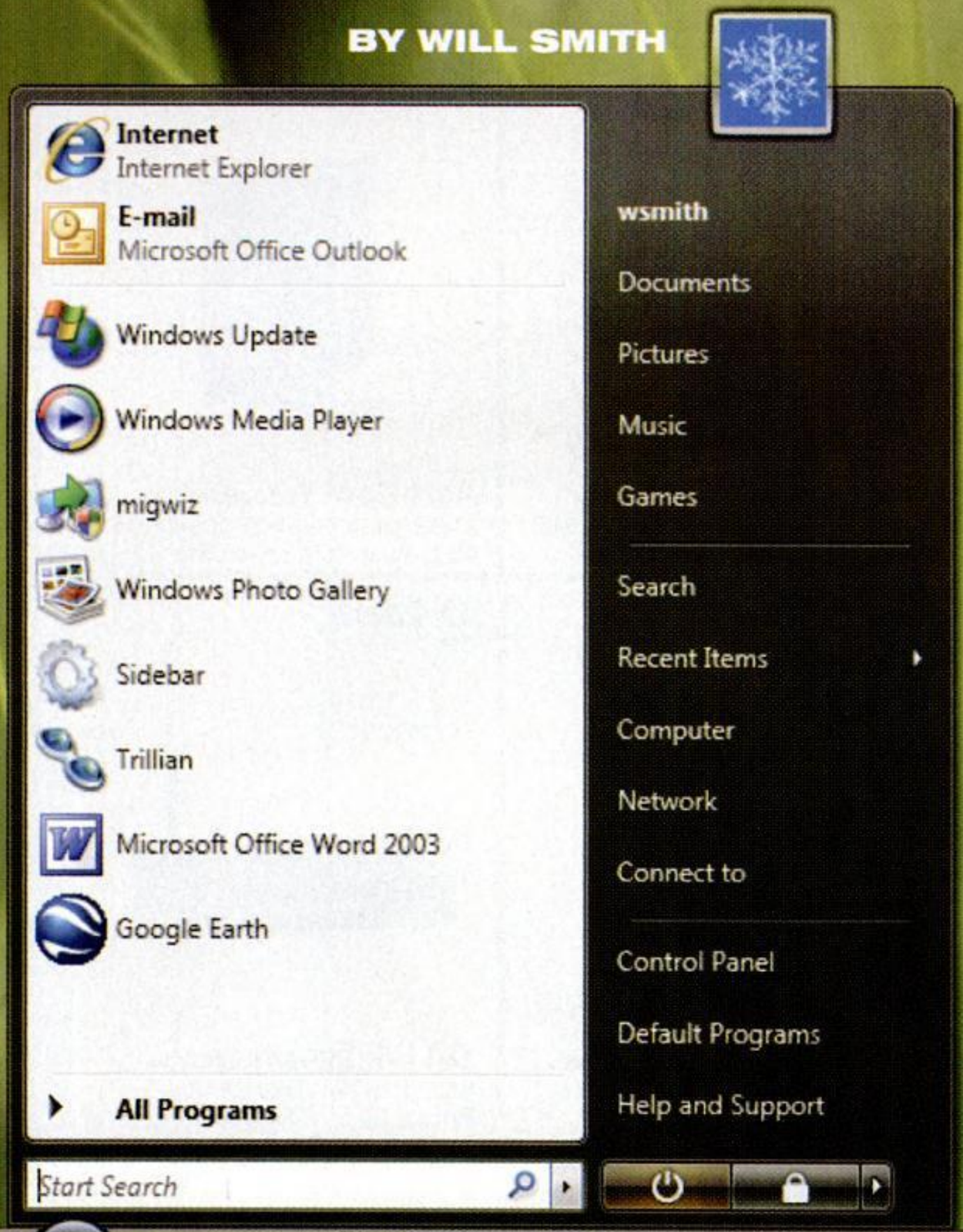

The next version of Windows promises to stress every component in your PC. Is your rig ready to make the move to the new OS? Is upgrading to Vista going to be worth the hassle?

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Are You Ready?

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File Edit Format View Help

By now, you've already heard that Microsoft has delayed Vista yet again, this time until early 2007. After spending hundreds of hours testing the latest build, we definitely understand why. Vista and the drivers it relies on aren't stable enough to ship. Nevertheless, we can extrapolate from build 5308 what the future has in store for us. We can even use this latest build to get a pretty good idea of how the OS will run on different levels of hardware. But first, let's cover the basics.

With Vista, Microsoft's goal is an operating system that will last for 10 or more years. To accomplish this, the brain trust in Redmond went over Windows XP with a fine-toothed comb, looking for any legacy code, then revamping, rewriting, or just plain excising it as the situation demanded. Old code wasn't the only thing that went under the hatchet; all those weird things that never made sense (why are there mail-related settings in both the Mail control panel, and the Internet control panel?) were reworked.

When you sit down for the first time with Vista, it's not going to be a totally alien experience, but there are significant differences, especially if you've grown used to Windows XP's quirks. It's like traveling to a foreign country where everyone speaks English. The basic stuff is the same, but it just feels a little strange.

So sit back, relax, and enjoy our guided tour of Vista. When you've got your fill of the new features and whatnot, turn to page 35 and see how our 15 test machines fared when running the beta OS. We'll help you plot your upgrades so your machine will be ready for Vista, whenever it finally ships!

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User Interface and Usability Changes

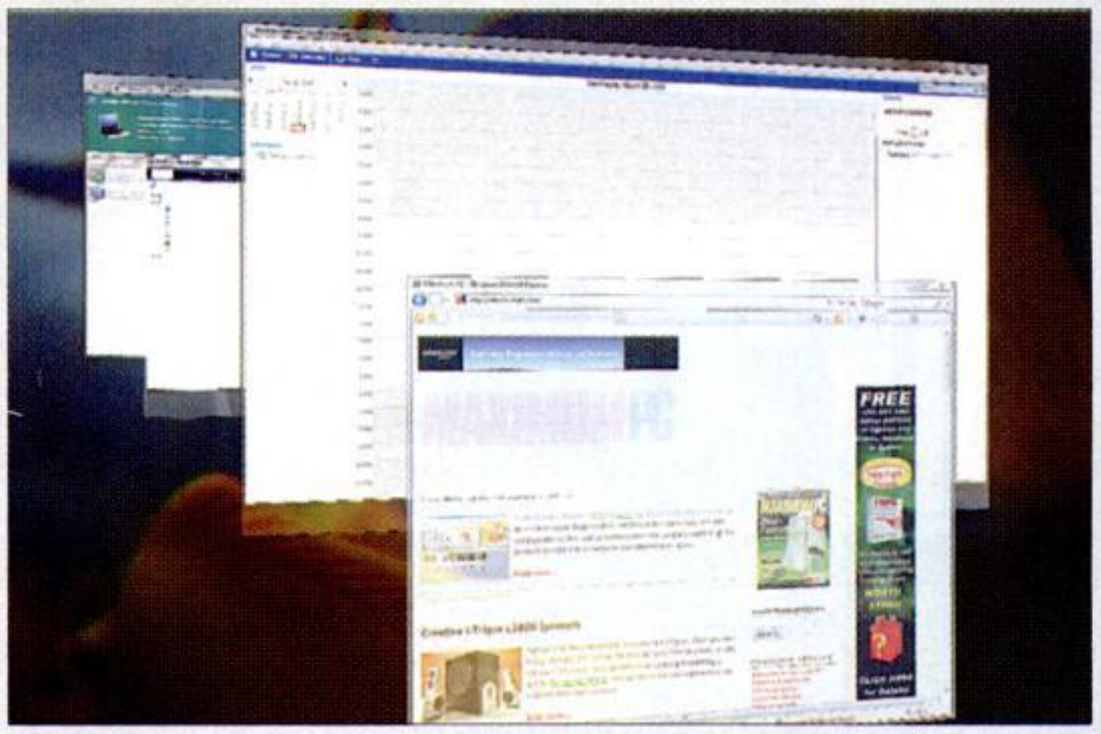
The first thing you'll notice when you fire up Vista is the new user interface (UI), but many portions of the next-gen OS were redesigned from the ground up to make it easier to use and more powerful

Aero Glass

We've already talked about Vista's 3D-rendered interface ad nauseum, but we'll touch on it again here. In Vista, Microsoft chucks the last 20 years of 2D GDI-based rendering in favor of a new graphics model—Windows Graphics Foundation. Aero Glass leverages the power of your DirectX 9 (or higher) graphics card to render windows on your desktop.

That sounds neat, but what's the benefit? Aside from the obvious whiz-bang transparency effect around all your windows, the biggest improvement is that everything on your display will scale up or down in size. So if you use an ultra-high resolution display, but can't read the resulting tiny fonts, you can scale everything—the size of the text, windows, and even elements of Windows—without any jagged edges appearing anywhere. You'll also be able to resize your document icons on the fly, display advanced thumbnails (even those including live video), and arrange and redraw windows quickly. So instead of Alt-Tabbing through icons of the open applications, you can Alt-Tab through thumbnails of the windows' contents, or even flip through the windows themselves!

In order to run Aero Glass, your machine must have a Shader Model 2.0-compatible videocard. For all intents and purposes, this means any Radeon 9500 (or faster) card or any of the GeForce 6000-series boards, as well as GeForce 5000-series boards faster than the 5700.



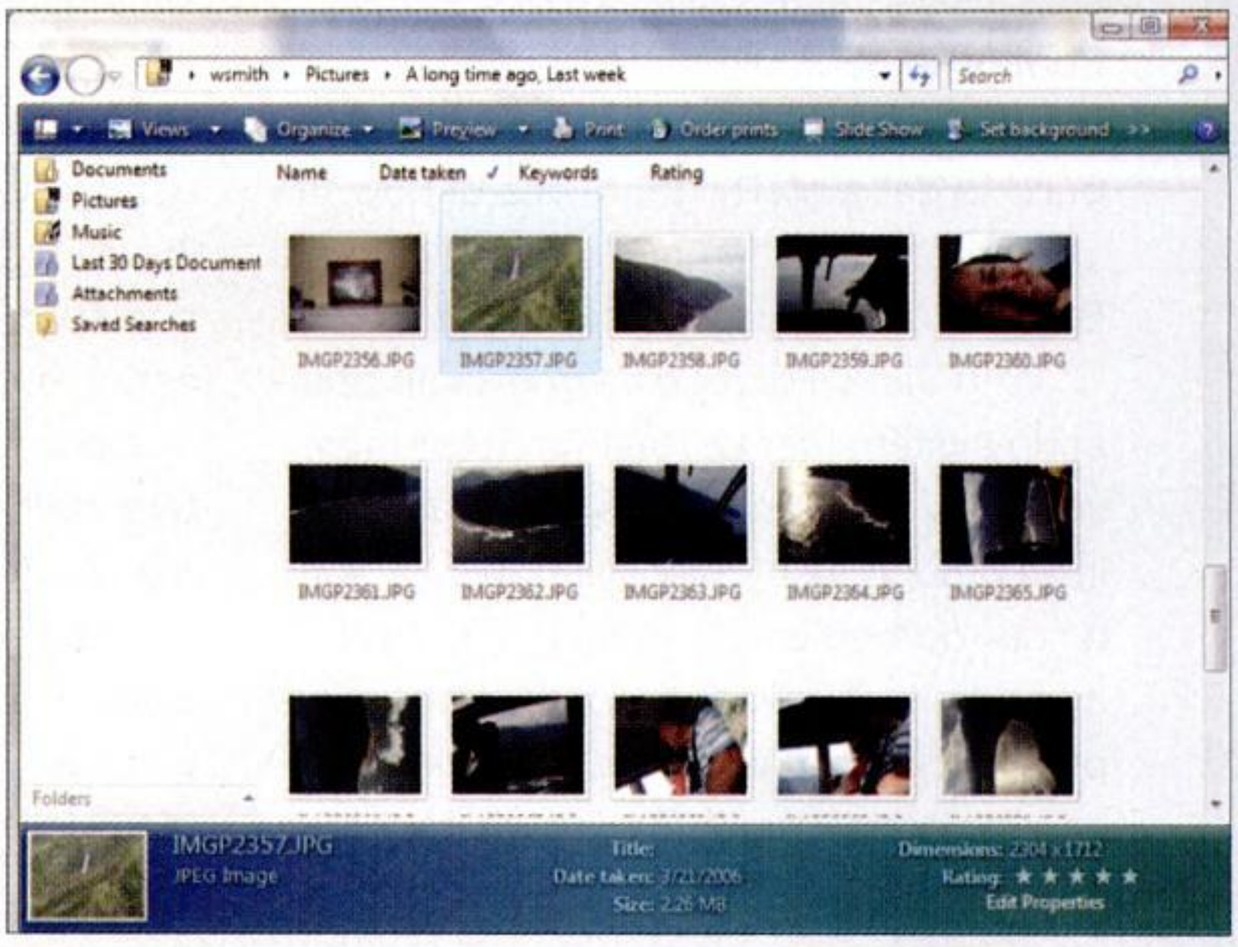
The new Aero Glass interface treats each window as a rendered object. It can do thumbnail previews in real time, or simply scroll through windows.

Search

For a long time, we didn't see the need for a more advanced search routine. Then we spent a little time with the new desktop search engines that have more in common with Google's web search than with that flea-infested old dog of a Windows solution. A high-speed desktop search indexes the contents of every document, email, instant message, and file on your system, so your search is no longer restricted to the (often arbitrary) filename.

Sure, if you're like us, you'll still keep your Documents directory hyper-organized. We're not about to start storing all our *Word* documents, photos, and MP3s on our Desktop, and we don't expect you to either. But should you need to perform a desktop search—whether it's for your Aunt Mildred's birthday buried in an email, or the number of times the word "asstastic" has appeared in *Maximum PC* (three total, including this one), the info is there for you.

Vista's new built-in search delivers an experience that's virtually identical to the third-party desktop search utilities. But unlike some of the third-party desktop searches, Vista's indexing process is intelligent. Instead of simply watching for keyboard or mouse activity, Vista actually looks at CPU usage by applications and services before it determines that it's safe to index. That means you won't ever notice a slowdown in, say, your video encode because the indexing process starts unexpectedly.



These image-preview images will smoothly scale from miniscule to humongous at the nudge of a slider. In Vista you'll get fancy previews for more types of files too, including *Word* documents and *Excel* spreadsheets.

Continued on page 28→

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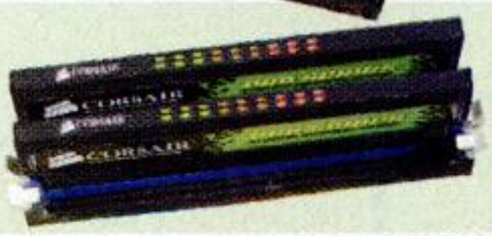

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Behind-the-Scenes Changes

To make the new operating system more reliable and perform better, Microsoft has rewritten large portions of Vista's code base

New Graphics Technology

You already know all about Aero Glass, but we haven't really talked about the enhancements to the base levels of the operating system that make the vector-based Aero UI work. To make the 3D desktop feasible, Microsoft ditched the ancient 2D-only GDI and replaced it with the totally redesigned Windows Desktop Driver Model (WDDM). Microsoft based Vista's new display driver model on DirectX 9, with some serious updates to both improve stability and work effectively with multiple target windows.

Vista's new graphics-driver model allows the OS to distribute GPU cycles, much like it apportions CPU cycles. This GPU virtualization lets multiple applications access the 3D functionality of the GPU at the same time. In Windows XP the GPU is an all-or-nothing resource; when you run a 3D app in a window, you experience greatly reduced performance because the GPU has to keep switching from 2D to 3D mode. In Vista, those state-changes are no more, and windowed performance of 3D apps is greatly improved.

WDDM also improves stability and error recovery. In XP, when an app crashes the graphics driver, it usually means you've got to reboot the PC. Vista's graphics-driver model lets the OS reinitialize the graphics card on the fly in the event of a crash. After a few weeks with Vista, we can attest to the fact that the OS is actually pretty good at recovering when beta drivers crash.

DirectX 10

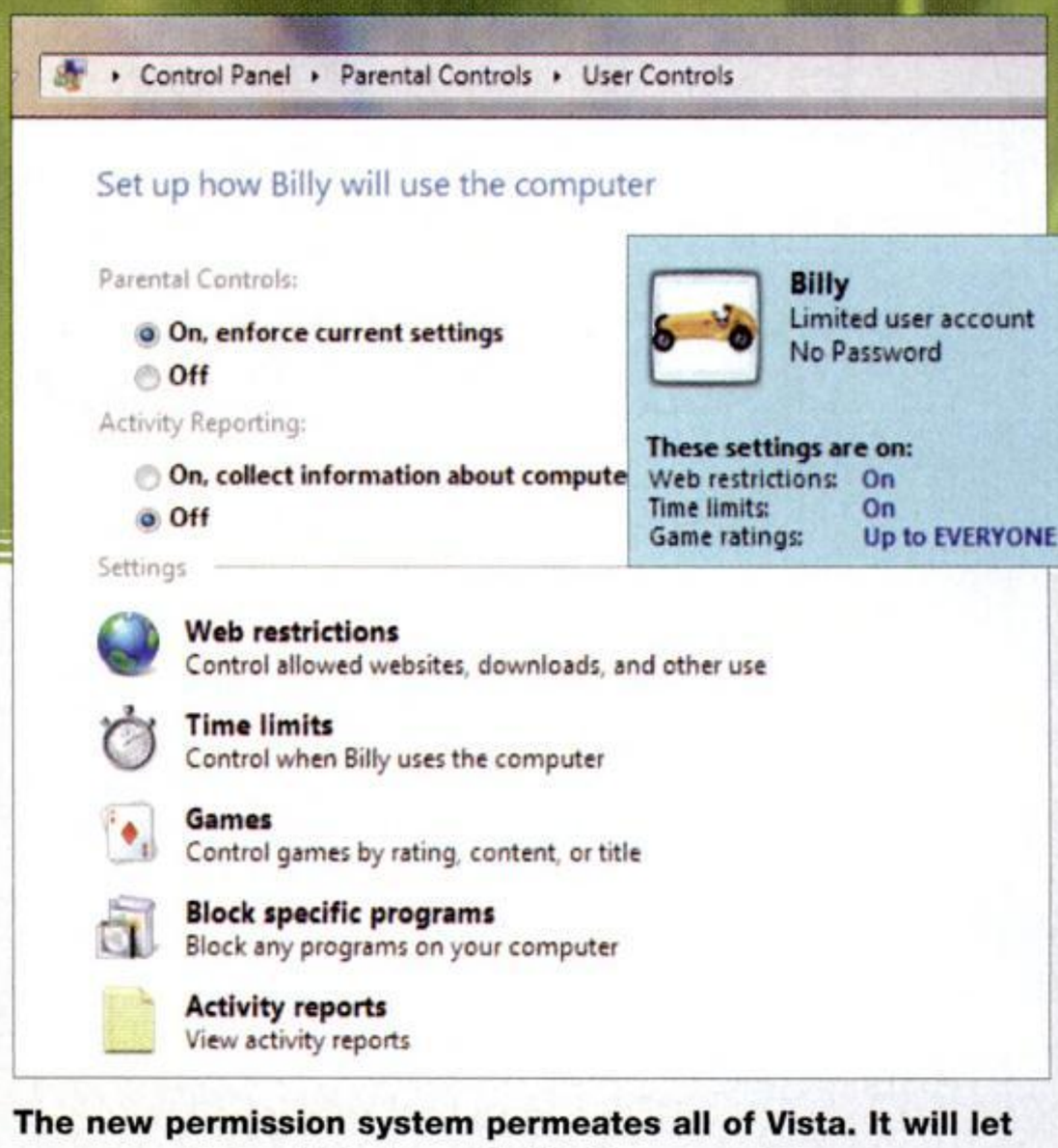
In addition to the WDDM enhancements, there's also a whole new version of DirectX in Vista. DirectX 10 adds a completely new type of shader—the geometry shader—as well as a complete unification of the different shader-model languages. The geometry shader will allow developers to modify basic structures. Unlike the vertex shader units, which programmatically modify single vertices, the geometry shader will work on entire primitives—such as flowing cloth and sheets of water.

Permissions Revamp

One of Microsoft's main goals for Vista was to accommodate a new security model. In Vista, everyone—even people who would typically use an Admin account in XP—use an account that doesn't have permission to install apps in Program Files. It seems like a fairly simple change, but there's a lot more to it than you might think.

Much like a Linux install, Vista only allows you to run applications from folders with the appropriate permissions. And it locks down the write permissions on those folders so that malware can't use your Administrator permissions to install itself to a hidden folder on your drive and then run whenever it wants. On a properly configured Vista machine, you'll have to explicitly give permission whenever any application tries to put anything in Program Files. Bravo.

But what about all those legacy applications that need write access to the Program Files directory? All those games that save your game in the Program Files directory will continue to work. Vista has a contingency: You'll install your legacy app in C:/Program Files, just like always, but any files that the app tries to write to its C:/Program Files sub-directory will actually end up in a sub-directory of your user profile. Any files in that directory will appear to the application to be in the correct place, so the app will work, but your main Windows install will be secure.



The new permission system permeates all of Vista. It will let you prevent your kids from playing inappropriate games.

The upshot is this: Even if you manage to infect a properly configured Vista machine with spyware, viruses, or some other Internet nasty, the infestation will be contained within your user profile. In a worst case scenario, you should be able to back up your important data, create a new account, and delete your old one to fix any problem.

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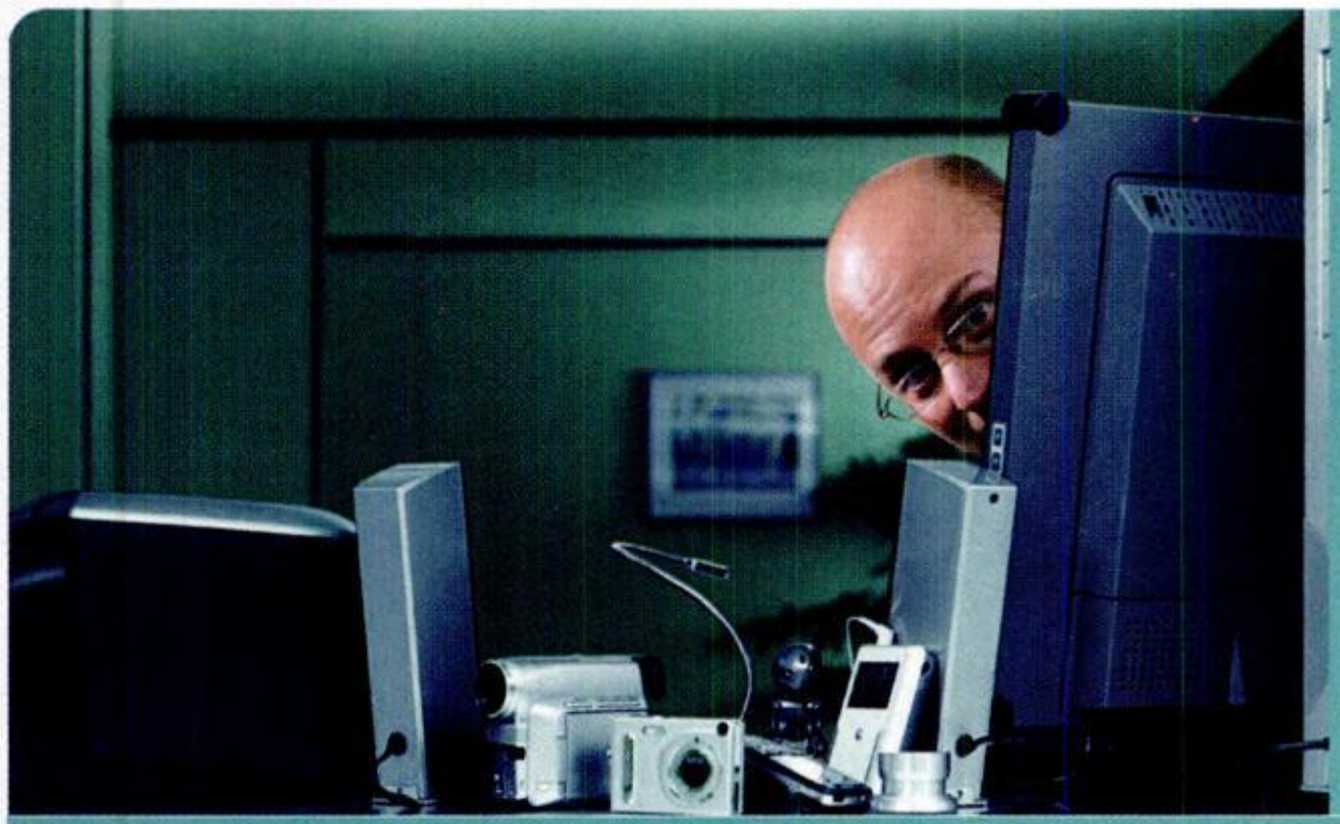

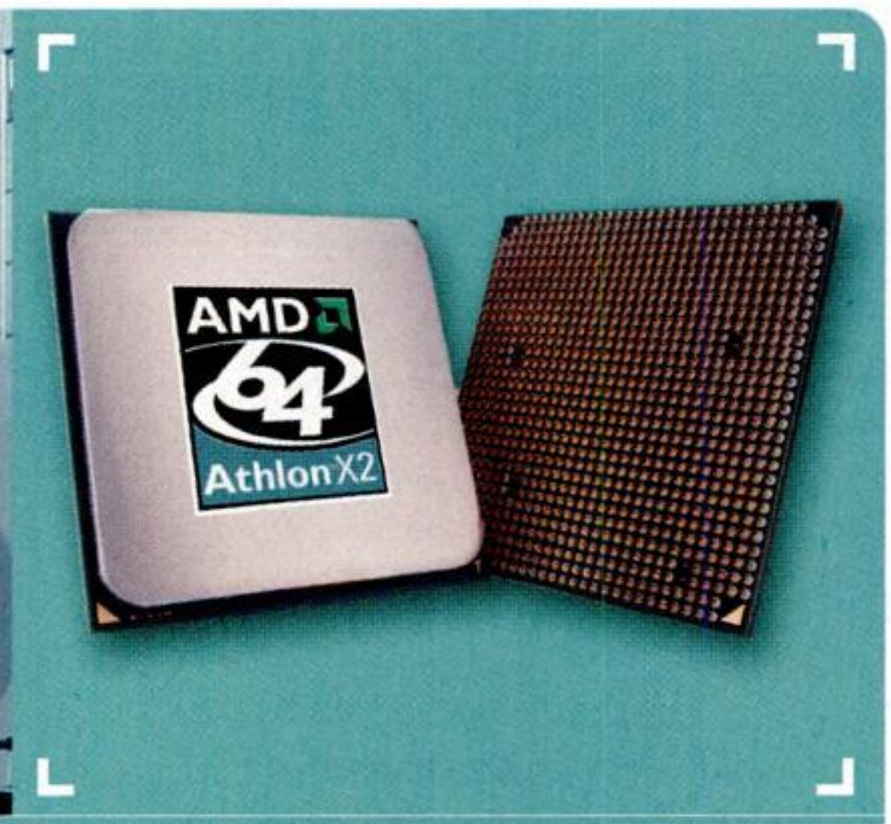

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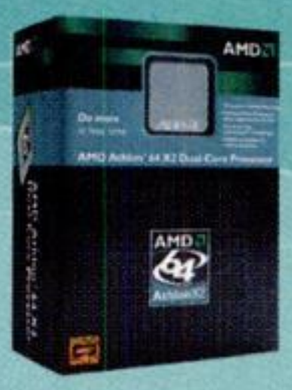

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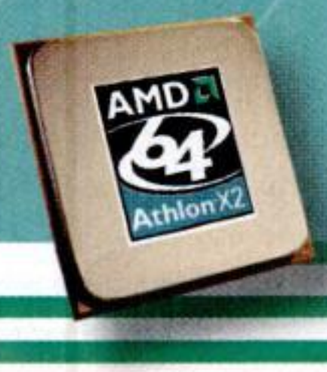

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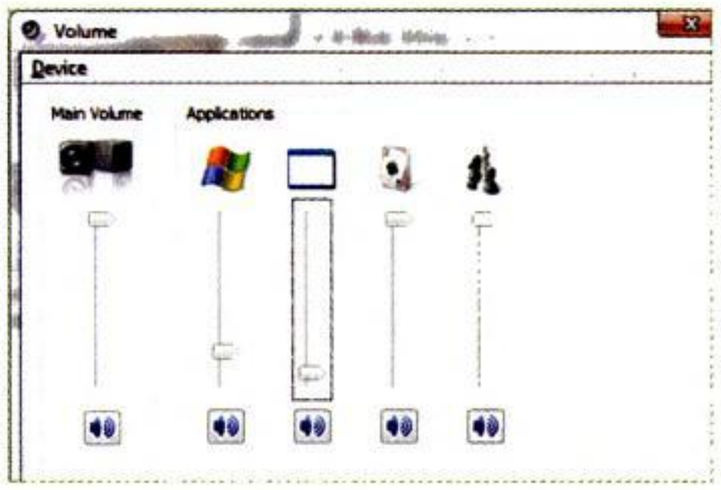
Audio Engine

Now this is a novel approach to volume control: Instead of sliders based on the type of content being played—why does XP's volume-control panel have 10 options, when the only ones you ever need are Wave and Main?—Vista's volume control is based on the sources and outputs you use. So rather than tweaking the Wave slider to adjust everything from *Windows Media Player* to your games, each individual app gets its own slider in the volume-control panel. Additionally, each output has a master volume, so you can adjust the volume level for your headphones independently of your speaker volume.



Instead of managing volumes for esoteric inputs, the Vista panel lets you set the volume per-app.

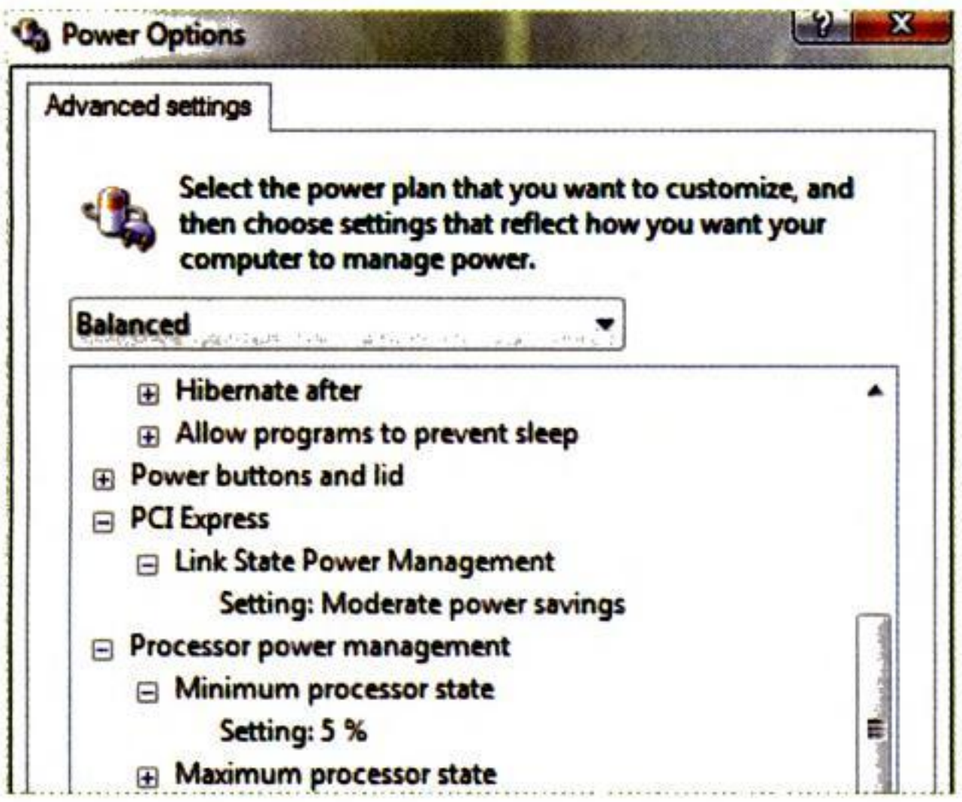
When properly configured, per-application volume control should prevent the *iTunes*-is-super-quiet-but-*Quake*-blasts-my-ears-off problem that's common to Windows XP. Of course, most apps—including *iTunes* and many games—already include independent volume sliders, but Vista puts them all in one convenient panel.

The much-needed sound-interface changes aren't all that's new in Vista. Microsoft has finally moved the audio subsystem out of the kernel and into the user space. This essentially means that Vista treats the OS-level sound software and your soundcard's drivers just like any another app you run on your PC, instead of as special system-level processes. This should improve overall system stability, as audio crashes will no longer bring down the entire OS.

But wait, there's more. Perhaps the least-sexy change is the move from a 16-bit integer format for audio data to a 32-bit floating-point format. Although the 32-bit floating-point format contains more information, the big improvement will be for people using CPU-based integrated soundcards. Modern CPUs can handle floating-point math much more efficiently than integer math, so we expect that this change will decrease the performance hit you suffer from running an integrated sound controller.

Power Management

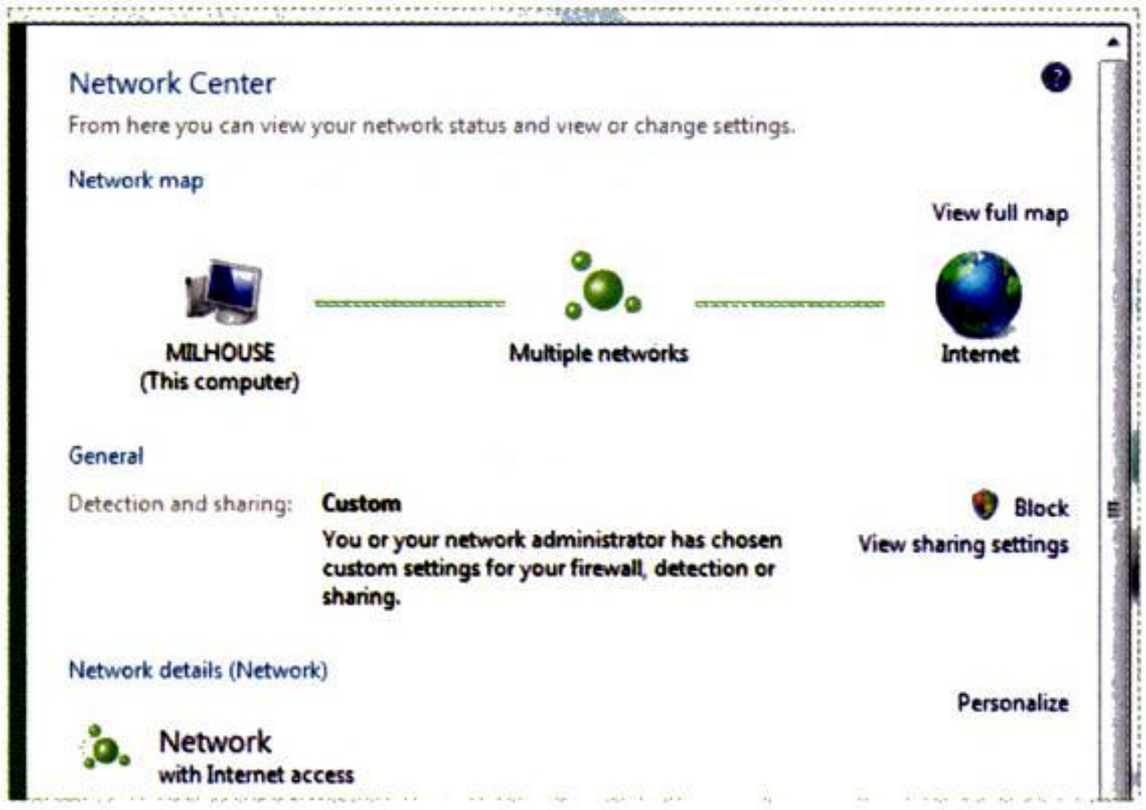
It ain't easy being green, especially if you're a Windows XP desktop machine. With Vista, many of the power-management features that are typically limited to OEM laptop machines will be available to everyone. We were able to create profiles with custom settings for different uses. We throttled down our CPU speed, lowered our wireless power consumption, and even decreased the PCI Express bus' power consumption on our desktop rig. Quiet-computing aficionados, rejoice!



Vista's power management tools give you a much more granular level of control over the power the components in your rig consumes. You can tweak everything from the CPU's minimum and maximum speed to the power that goes to your PCI Express bus.

Networking Faster, Networking Easier

Like many other components of the OS, Vista's network system has been rewritten from the ground up. Remember, XP's network stack was based on technology that originally appeared when a 14.4 modem was cutting-edge. The new Vista stack is a complete do-over, and everything is new and improved. We love the plain-English error messages, and the rewrite greatly improved our network performance by reducing overhead. We were able to download large files about 15 percent faster using Vista than we could on the same PC with Windows XP. Heck, Vista even includes native support for the next-gen IPv6 protocol.



In addition to a fancy new interface that lets you see exactly how your computer is connected to the Internet, Vista's newly rewritten networking code delivers some impressive speed benefits. We were able to download files significantly faster under Vista than we were on XP.

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Vista's New Apps

With new versions of Windows come all-new applications. Here's a look at the freebie apps Microsoft is including with Vista

Internet Explorer 7

Microsoft's answer to *Firefox* will be available for Windows XP first, but *IE7* will really come into its own when you run it on Vista. *IE7* will be one of the first apps to leverage the Aero Glass interface, actually using the fancy new rendering tech for something useful. On Vista, you can navigate your open tabs using a page of thumbnails, which show the contents of each tab. Of course, *Firefox* users can get similar functionality using the Reveal extension.

***Internet Explorer 7* takes advantage of the new renderer to render a preview page of all the tabs open on your computer at once. And, it only works on Vista!**

Windows Collaboration

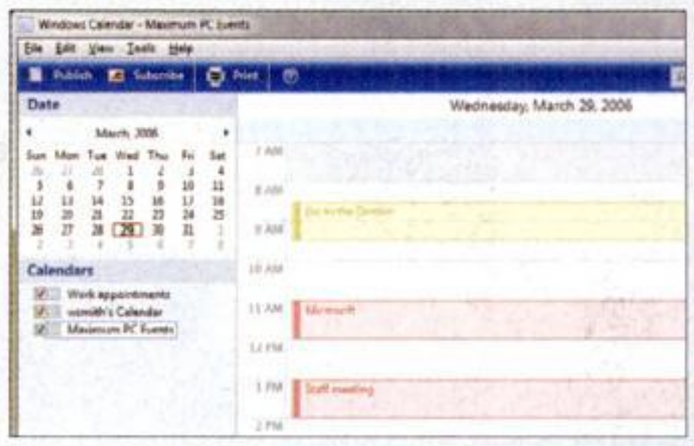
Part Rendezvous user-discovery service, and part weird business-collaboration software, the new Windows Collaboration app has us scratching our heads. Sure, it's great to share your files, but in most office environments, the tools to do this are already present (hint: they're called file servers). As for working together in apps, if you're in the same subnet and UPNP discovery works, you're probably close enough to get up and walk over to your collaborator's desk.

Backup Utility

The backup utility built into Windows XP is a pathetic remnant of Windows 3.1, designed to work with 100MB tape backups and other such nonsense. Vista's backup utility was designed to work with modern backup drives, and gives you multiple backup options, which work really well when paired. With the utility, you can save a complete image of your Windows install to an external hard drive, just like you would with a third-party app such as *Ghost*. *Backup* also lets you run regularly scheduled backups of your profile directories. With these tools, you should be able to keep the contents of your machine regularly backed up, for relatively painless recovery in the event of a hardware failure.

Windows Calendar and Mail

We're big fans of the simple, yet very powerful *iCal* calendar program that ships with OS X. By embracing open document formats, *iCal* makes it easy for people to share their calendars with anyone on the Internet. *Windows Calendar* could deliver the same functionality to Windows users. If so, we'll gladly ditch *Outlook's* over-engineered scheduling program for a faster, lighter, simpler, more ubiquitous calendaring app.



Kiss *Outlook* goodbye! *Windows Calendar* offers quick 'n easy shared calendars for everyone with Vista.

With Vista comes a new mail client to replace *Outlook Express,* but frankly, we're not terribly excited about it (or any new mail clients, for that matter). As far as we're concerned, the stand-alone mail client is a dying breed. The access-anywhere convenience, seemingly limitless storage capacity, and raw power of modern webmail makes us wonder if there's a future for any POP clients.

Parental Controls

You love playing *Grand Theft Auto,* but you don't want your 12-year-old to fire it up when you're not around. That's understandable. But up until now, there was no easy way for you to lock your kids out of inappropriate games if they could log onto the same computer—at least, not without mucking around with confusing security settings. Vista's gaming portal lets you, as an Administrator, determine which games are appropriate for your kids, selecting by either ESRB rating, specific types of content, or on a game-by-game basis. These permissions are applied at the OS level, so not only will your kids not see the game on the Games screen, they won't be able to bypass your edict by browsing to the directory in Windows Explorer.

Sidebar + Gadgets

First there were Konfabulator Widgets, then there were Dashboard Widgets, and now there are Windows Gadgets. They all serve essentially the same purpose—delivering to the user some bit of information or access to a utility in an ever-present, always-on way. With Vista, you can embed your Gadgets in the desktop, just like with *Konfabulator*, or you can mount them to the new Sidebar.

Continued on page 34→

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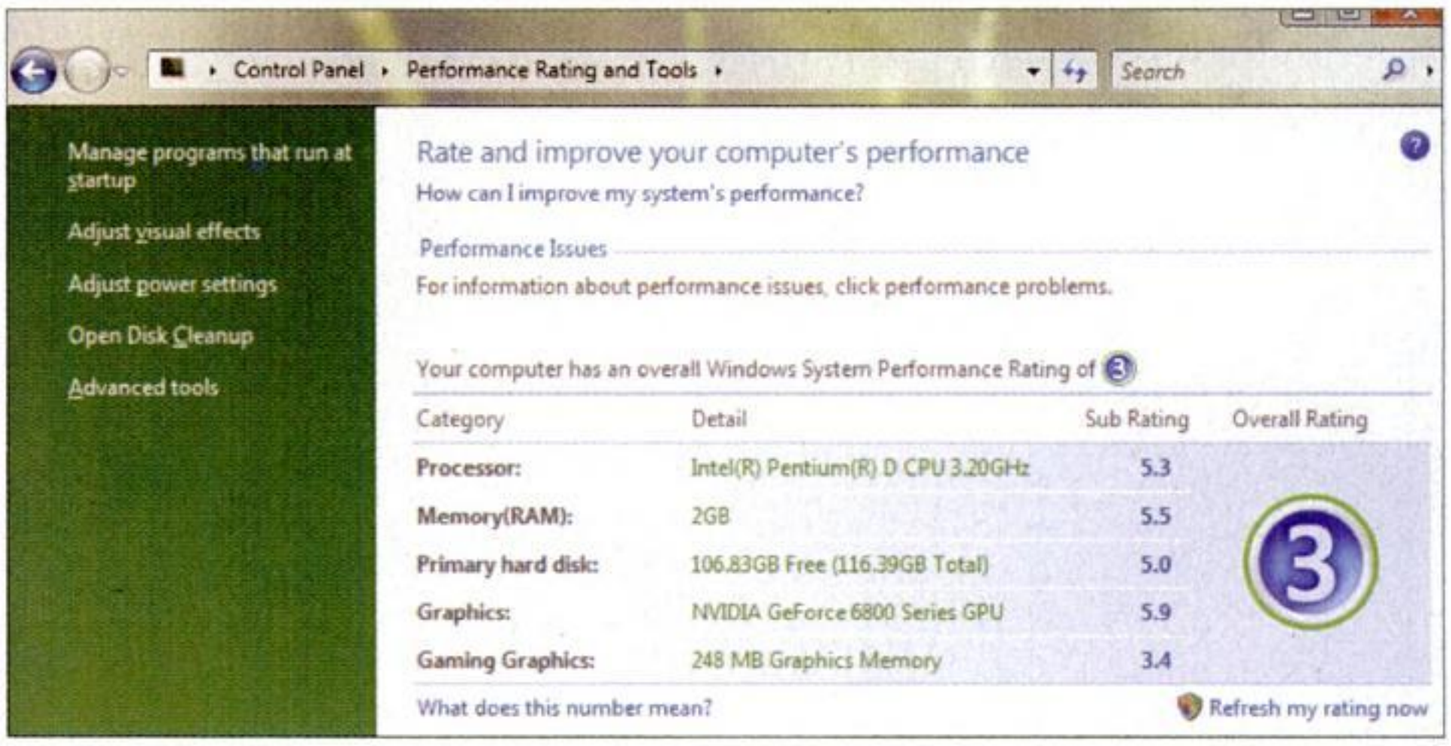
Continued from page 32

Say Goodbye to Mystery System Slowdown

Vista's integrated performance monitor promises to end system lag

We've all experienced it: Your once lightning-fast PC's performance degrades over a period of months until it's slower than molasses in January. Everything creeps to a crawl—from the time it takes your PC to boot, to the time it takes to load apps, to your frame rate in games. Windows Vista's System Assessment Tool (WinSAT) aims to stop the mystery slowdowns forever by including both a means of analyzing your rig's performance and a control panel that will help you troubleshoot and repair potential problems.



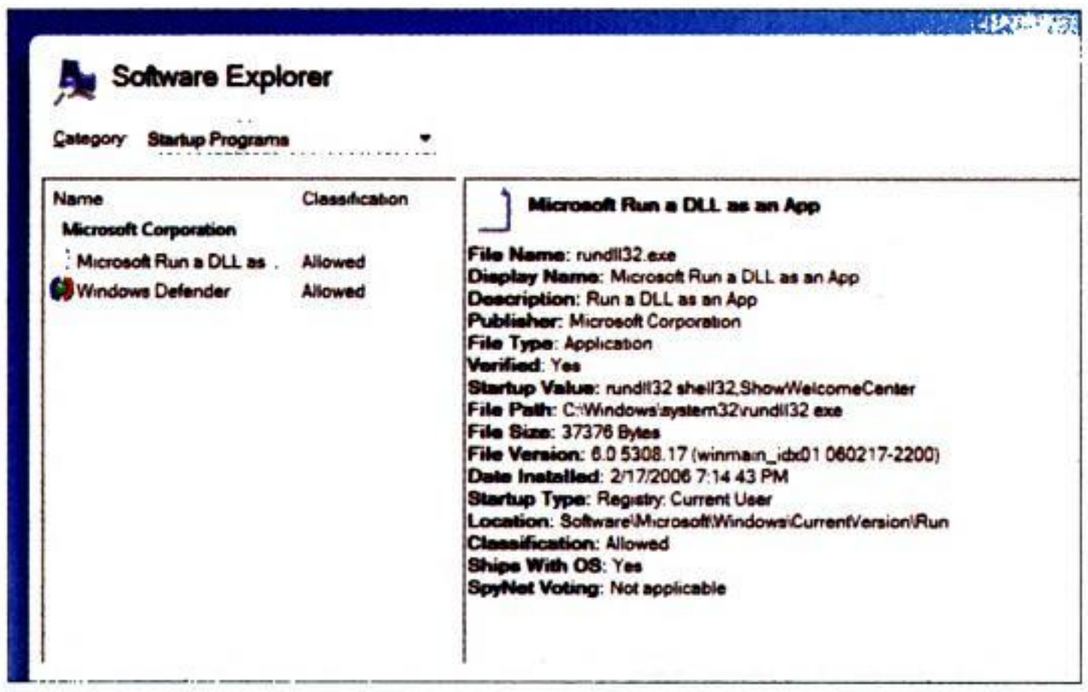
"Judge not, lest ye be judged" is not a saying the kids in Redmond are familiar with. Each Vista rig will be assigned a rating describing its capabilities.

FIRST YOU DIAGNOSE THE PROBLEMS...

Before you start your first session in Vista, WinSAT fires up, looks deep into your computer's hardware soul, and then tests the system to see what it's capable of. In the beginning, it will measure your CPU's performance, your videocard's speed and capabilities, the amount and speed of your system memory, and your hard drive's speed and capacity. WinSAT then assigns each subsystem a score, from 1 to 5, based on the relative performance of that part compared with the minimum hardware requirements for Vista. Then, WinSAT automatically tweaks Vista's whiz-bang features, even disabling some if necessary, to accommodate what your hardware can handle.

WinSAT not only determines the initial configuration for features like Aero Glass, but it also has another trick. Third-party applications—think games here—will be able to hook into WinSAT to determine your PC's capabilities. We sincerely hope this eliminates the need to go into the settings pane for every game, to manually tweak the resolution, detail level, and other advanced features. Ideally, WinSAT will determine that your videocard can run with settings cranked up, that your high-end CPU delivers enough juice to run with 3D audio enabled, and that your display supports crazy-high resolutions.

After an initial analysis, WinSAT will only run when it detects major changes to your system—which likely means a hardware upgrade—though you will be able to force WinSAT to retest the system from within the Performance control panel. As for performance drop-offs between upgrades, Vista also includes a lightweight utility—a black box, if you will—that measures different day-to-day performance metrics of your system. It will measure your boot time, the time it takes to load applications, and even game performance. When it detects a potential problem, the monitor utility will notify you via a friendly message, then it will hand off duties to the Performance control panel for repair.



***Windows Defender* gives you an easy interface to prevent unwanted apps from loading with Windows.**

...THEN YOU FIX THEM

Enter the Performance control panel, where Vista solves problems. We haven't had a ton of time to test the different responses to typical problems, but we expect that the final OS will include fixes for most major issues.

To give you an idea of how it might break down, here's an example that actually happened during our Vista testing. We were setting up a Vista test machine by installing a series of applications. After a reboot, the Performance monitor popped up, told us it detected a slowdown in our boot time, and also informed us that the slowdown occurred after a couple of new apps were installed. Then it presented us with a *Windows Defender* panel that let us disable the boot-time components of offending apps. What previously would have taken two apps (the now-unsupported *bootvis* and msconfig) and a 20 minutes to fix, took about two minutes.

We haven't tested the other aspects of the OS enough to know whether all fixes will be this easy, but if it works as well as it did on our test system, we're big fans already.

How Does Your Rig Stack Up?

We set up a bunch of test rigs to determine how different hardware configs score in WinSAT. Here's how the scoring system works, and how the scores break down component by component

The scoring system is quite simple. An overall score of 1 represents the lowest level of hardware required to run Windows Vista. An overall score of 5 represents the fastest hardware available when Vista shipped. Of course, Vista's going to be around for at least five years, so there's plenty of room for growth in the scale. When new hardware becomes available, Microsoft will add higher ratings to the scale.

The overall score is a composite of five other scores—one each for CPU, videocard, videocard memory, system memory, and hard disk. Each of the composite scores takes into account different criteria; for example, the videocard score might look at your card's clock speeds, the Shader Model it supports, and the number of pipelines. The hard drive score would be simpler, looking at the burst and sustained throughput numbers for the drive and possibly the size of the cache. Each of the individual scores are fed into an equation that weighs them against each other to create the overall score. If you have an unusually fast CPU paired with a slow videocard, WinSAT will take that into account when calculating the final score.

We fully expect to see the minimum WinSAT score on game packaging in the future, to help simplify the bewildering game-buying process for newbs who don't know the difference between a Radeon and a Pentium. MPC

WHAT WORKS AND WHAT DOESN'T

Naturally, we couldn't build every possible configuration, but we did try a variety of different CPU and videocard combinations, since Vista seems to weight those two components more heavily than the memory and hard drive performance. It's worth noting that Vista enabled the Aero Glass interface with all of the tested configurations, although it did not when we tested an ancient DirectX 8 GeForce4 card.

The WinSAT overall score seems to revert to the lowest factor. On our 3.2GHz Pentium D example, all the components scored 5 or higher, save the graphics memory. Its score of 4 brought the entire system down to a 4. Likewise, putting a high-end videocard into an otherwise slow system won't boost your score.

CPU	VIDEOCARD	MEMORY	WINSAT SCORE
Intel Pentium 4 2GHz	Radeon 9500	512MB	1
Athlon XP 3200+	GeForce FX 5800 Ultra	512MB	2
Athlon XP 3200+	Radeon 9700 Pro	512MB	2
Athlon 64 3700+	GeForce 6800 GT	512MB	4
Athlon 64 3700+	Radeon X1800 XL	512MB	4
Intel 3.2GHz Pentium D	GeForce 6800 GT	2GB	4
Athlon FX-55	GeForce 6800 GT	1GB	4
Athlon FX-55	GeForce 7800 GTX	1GB	4
Athlon FX-55	Radeon x850 XT	1GB	4
Athlon FX-55	Radeon X1800 XL	1GB	4
Athlon X2 4800	SLI GeForce 7800 GTX	2GB	5
Athlon FX-60	GeForce 7800 GTX	1GB	5
Athlon FX-60	Radeon X1800 XL	1GB	5
Athlon FX-60	Radeon X850 XT	1GB	5
Intel Extreme 955	GeForce 7800 GTX	2GB	5

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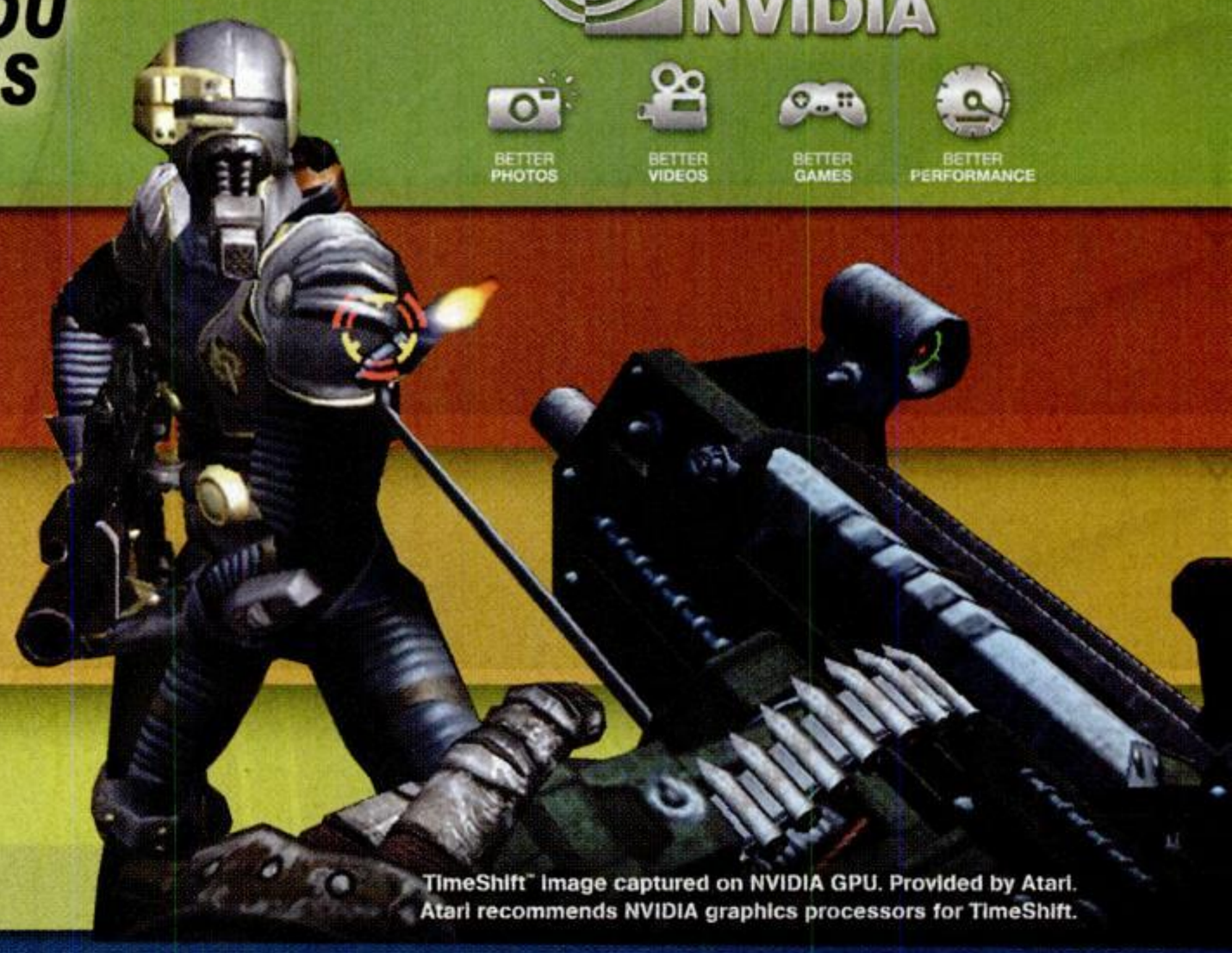

TimeShift™ image captured on NVIDIA GPU. Provided by Atari.
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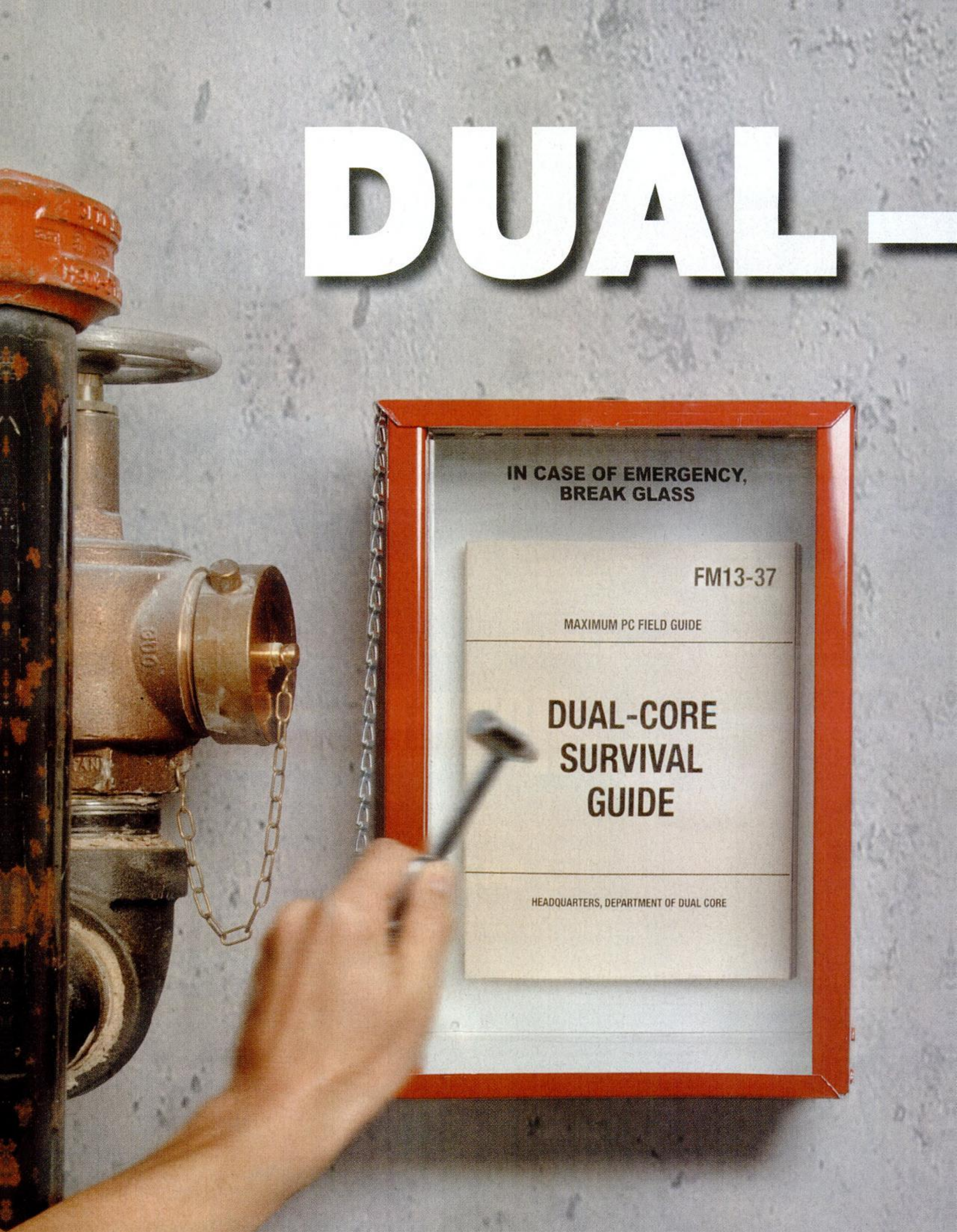

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DUAL-CORE SURVIVAL GUIDE

You've got a dual-core CPU, but do you know how to use it? Follow along as we show you how to trouble-shoot your dual-core problems, and put your new CPU to work in ways you never dreamed possible!

BY GORDON MAH UNG

Few technology launches are ever bug-free. Whether it's SLI, DDR memory, or SATA, there's always something broken at first. That's why we were surprised at the relative painlessness of the dual-core CPU rollout. For the most part, the hardware works exactly as expected. On the software side, however, the scenario is not as rosy.

The big issue is games. Some dual-core users complain that their new CPU renders games either super-slow or super-fast (the latter dubbed by one website as the "Benny Hill Effect"). These anomalies are rare but well-documented. They stem from a bedeviling blend of Windows issues and software that was written before anyone ever dreamed a desktop PC would boast dual processors.

In the old days, when dual-processor machines were limited to workstations, only a few developers bothered to qualify their applications for two-CPU configs. Thus, the two cores sometimes get out of sync when running older games or apps. And when the cores are out of sync, the software crashes, stutters, hangs, or all of the above. The problems are limited to a relatively small number of games and applications, but every dual-core user is a potential victim.

Maximum PC is here to help. We'll walk you through the problems and remedies, and get your system patched up in no time. Despite these issues, dual-core is still the bee's knees. To prove it, we'll show you some dual-core tricks that will leave your single-core friends salivating.

How to Fix Your Dual-Core Problems

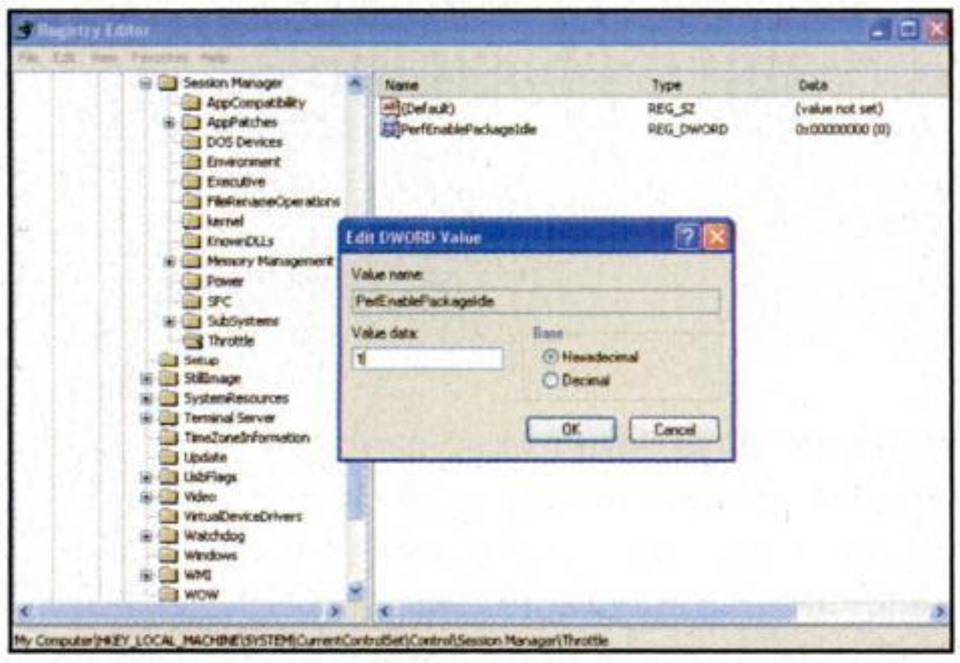
For the past few months, readers have stuffed our Ask the Doctor mailbox with emails complaining of bizarre game performance. And inevitably we find that there's a dual-core processor in the mix. We've experienced problems ourselves in games—*Beyond Good and Evil* comes immediately to mind. The problems can range from stuttering and choppiness to games running at hyper speeds, and can occur sporadically.

Don't fret: Both Microsoft and the hardware vendors have fixes for these issues, and on the next two pages we'll walk you through each of them, along with two other scenarios that can help you troubleshoot a dual-core PC.

The Windows XP Hotfix

Windows XP has issues with dual-core processors' low-power states. For example, in WinXP, AMD's Cool 'N' Quiet technology automatically throttles the CPU, lowering its clock speed when the system doesn't need the extra power, but sometimes Windows won't crank the CPU speed back up when the system needs the extra juice. You can spot this problem by running a CPU-intensive benchmark—Folding@Home or *Sisoft Sandra's* CPU test, for instance—several times. If you're affected by the bug, your scores will be all over the map.

Microsoft has released a hotfix that corrects the problem, but here's the weird part: It isn't available as a download from Microsoft's website. You have to contact Microsoft and specifically request the hotfix associated with issue "896256." Luckily, it is available for download at AMDzone.com. Just go to the website and search for "hot fix". Once you've installed the fix, you have to create a registry key to enable it.



The Microsoft hotfix is a registry hack that updates Windows to work with multiprocessor systems.

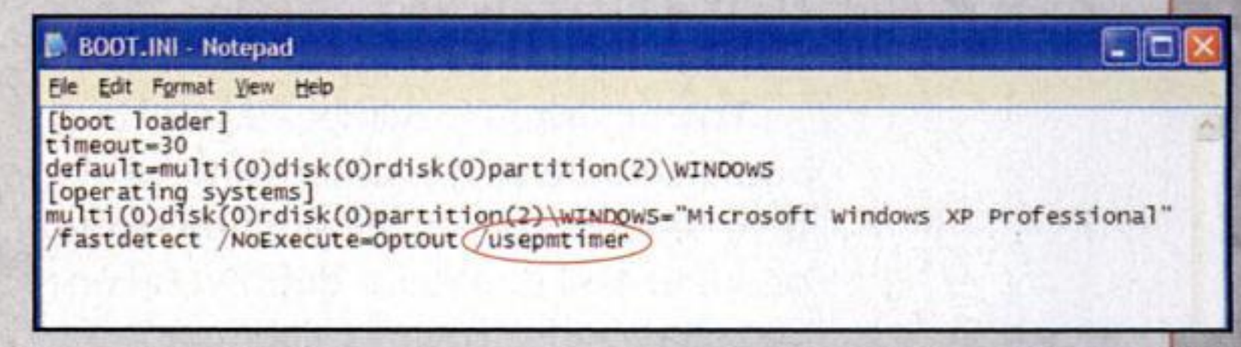
Here's how you do it:

1. Click Start, click Run, type regedit in the Open box, and then click OK.
2. Right-click HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Session Manager, go to New, and then select Key.
3. Type Throttle for the new key name.
4. Right-click Throttle, go to New, and then select DWORD Value.
5. Type PerfEnablePackageIdle for the value name.
6. Right-click PerfEnablePackageIdle, and then choose Modify.
7. In the Edit DWORD Value box, type 1. In the Value data box, make sure that Hexadecimal is selected, and then click OK.
8. Quit the registry editor.
9. Reboot the machine and the hotfix will be in effect.

The AMD Patch

AMD's Athlon 64 X2 and dual-core FX-series CPUs are indisputably the best CPUs for PC gaming, but they don't always play nice with games. Gamers are reporting a variety of problems, and AMD has addressed these irregularities with a "dual-core processor driver" update. It's available at **www.amd.com/us-en/assets/content_type/utilities/amdcpu.exe**.

This driver update corrects several issues by adding the line "/usepmtimer" to the boot.ini file. This small change allows both CPU cores to stay synced at all times, which reportedly fixes most of the issues we've mentioned. Intel does not offer a similar patch, but we've heard reports that adding the /usepmtimer line to the boot.ini will also fix gaming issues on Intel machines.



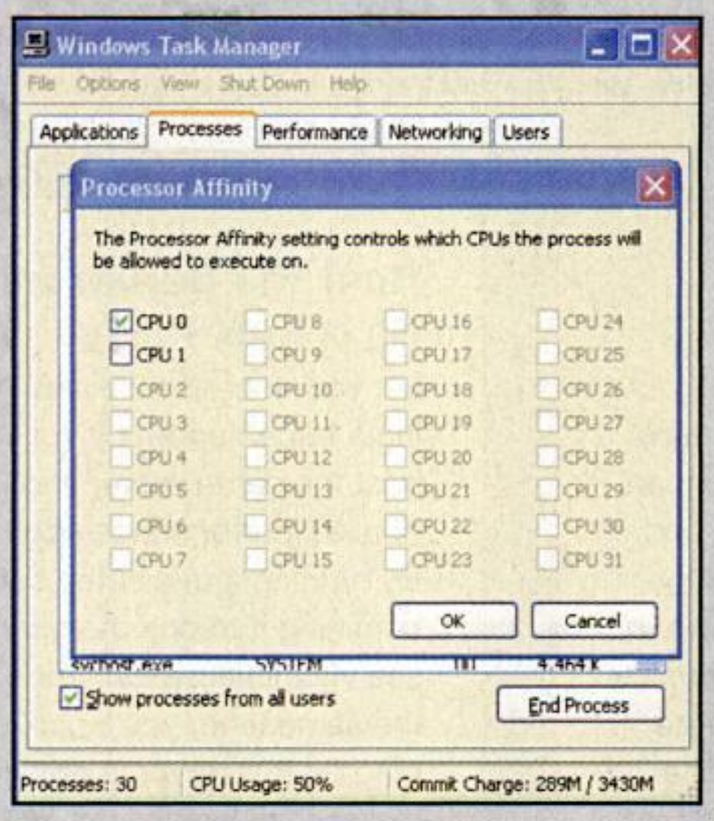
Adding one little line to the boot.ini file can help fix irregularities on Intel and AMD dual-core systems.

To add it manually, right-click My Computer and select Properties. Click the Advanced tab, and select Startup and Recovery. Click the edit button to edit the boot.ini file. Append the last line with /usepmtimer, save the file, and reboot.

To Affinity and Beyond

If you suspect that your dual-core CPU is causing problems with a game or application, and you want to quickly confirm or deny this, the best way is to manually set the CPU affinity for the application. Setting affinity essentially forces a process (application) to temporarily use a specific CPU core.

To set the affinity, start the application or game that's giving you problems. Press Alt-Tab in order to jump to the desktop. Press Ctrl-Alt-Del and select the Task Manager. Click the tab labeled Processes and locate the offending app or game. Right-click it, scroll down and click "set affinity." Remove the appropriate checkmarks so that only one CPU is selected for the process. Click OK and close the task manager. You can now press Alt-Tab to get back into your game, which will now be running on just one core.



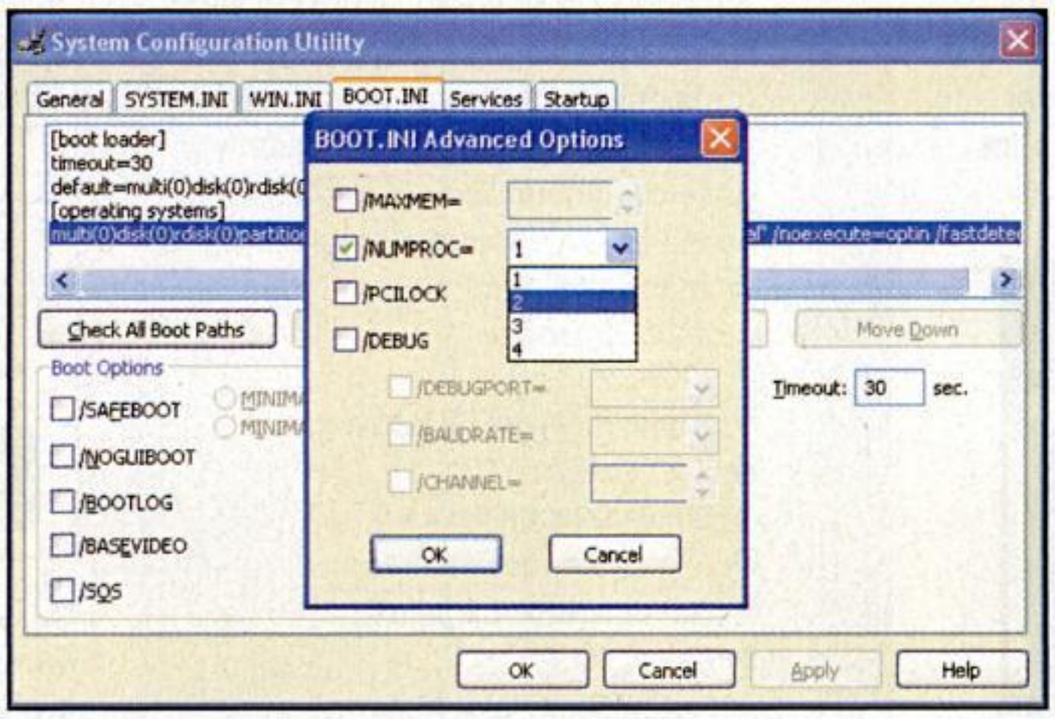
The quickest way to diagnose whether a problem is dual-core related is to set the application's CPU affinity manually.

Hide the Second Core from Windows

If you've tried the aforementioned remedies and are still having issues, and you're sure the problem is dual-core related, you can always execute the final fix: ordering Windows to stop using the second core altogether. Obviously, nobody likes running a dual-core CPU in single-core mode, but some apps simply will not run with a second core, so this option might be your only hope. And when the software manufacturer releases a fix for the issue, you can always undo this Windows fix so the second core is back in business.

The fix requires you to tweak the Windows System Configuration Utility, aka msconfig. Open it by clicking Start, then Run, and typing msconfig. Click the BOOT.INI tab and click the Advanced Options button. Check the box labeled /NUMPROC= and set it to 1. Click OK, reboot, and verify that Windows is ignoring the second processor by right-clicking the Taskbar, and clicking Task Manager. Go to the Performance tab, and under the CPU Usage History, you should see just a single CPU graph, not two.

In a month or seven, when the software vendor has corrected the problem, (or when you no longer need the app in question), you can undo this tweak by going back into the system configuration utility, selecting Advanced Options, and unchecking the /NUMPROC= statement. Reboot, go back into Task Manager, and click the Performance tab. There should now be more than one core visible.



If you're experiencing major issues, you can configure Windows to detect only one CPU core.

Is It AMD's Fault?

If you search the Internet for dual-core-related gaming problems, you'll notice one thing immediately: They all seem to involve AMD's Athlon 64 X2 CPUs.

But do they? AMD officials flatly deny that it's an Athlon-only issue and point out that Microsoft's own hotfix applies to "dual-core" processors, not just AMD chips. That's backed up by some developers who have described the problem occurring on both Intel and AMD dual-core processors. So why does all the bitching and moaning seem to be coming strictly from the AMD camp?

We suspect it's because of the popularity of Athlon 64 machines among gamers. In the last two years, gamers have fled from Intel to AMD for two reasons: better performance and SLI dual-videocard compatibility (initially only available on Athlon 64-based motherboards).

Of course, some dual-core users may never experience any problems at all. We tried to replicate the more common gaming problems, using both Intel and AMD dual-core systems in the Lab, and were unable to do so. Several of our staffers, however, have personally had issues on their dual-core machines at home. The simple fact is that, while elusive, dual-core problems do exist, and not only on AMD machines.

Let the Thread Times Flow

You've solved your weird dual-core hiccups with our tips (and the timely sacrifice of one poor chicken), and now you're looking for some positive reinforcement of your decision to go dual-core. Don't worry young man/woman/child, you've made the right choice. To prove it, we're going to show you four activities that would bring the mightiest single-core rig to its knees, but that run like buttah on a dualie.

Think of It as a Duplex for Folding@Home

Folding@Home is a distributed computing project being run by Stanford University. It uses your computer's CPU to analyze data on human diseases such as Alzheimer's, Parkinson's, and cancer. For F@H fanatics, a dual-core machine is a dream come true because it can handle two work units at once. It's tricky, however, to configure F@H to take full advantage of the separate cores. To do that, you'll need to download the no-nonsense command-line version of the client for your OS from **http://folding.stanford.edu/** and follow these instructions.

Place the downloaded client into a folder in Program Files and label it FAH1. Copy the folder and its contents to a second folder labeled FAH2. Execute the file named FAH504-Console.exe from FAH1. Choose a user name. If you want a unique name, check the Folding website to see what user names are still available. Enter a team number (*Maximum PC's* team number is 11108). If you want the program to launch automatically when you start Windows, answer yes to the service question, otherwise hit enter. Stick with the default settings until you get to the option to change advanced settings. You can select the defaults until you reach the question for Machine ID. Select 1 for this session and click enter. The program will go out to the Internet, download work units, and begin crunching them.

Minimize the first console and open the second folder, FAH2. Repeat the sequence until you get to the question about machine ID. For this folder, set it as 2. If you have a dual-core CPU with Hyper-Threading you can run four clients simultaneously, although the performance bump isn't as dramatic. Check our Folding forum at **www.maximumpc.com/forums** for more F@H tips and tweaks.

You can fold proteins twice as fast with a dualie by running two clients simultaneously.

Host the Server at Your Next LAN Party

Let your friends think you're shouldering a huge burden by volunteering to host the game server and keep your dualie's performance edge to yourself. By running a dedicated server and confining it to one of your cores, you'll see very little performance impact. At the same time, you'll pick up a zero ping on the server (it doesn't get any closer than inside your PC); plus you have control over the server's name and the options you want to run. The most efficient way to do this is to download the separate dedicated server file for the game you're planning to run. Start the dedicated server and set the affinity for the process using the steps we showed you in our troubleshooting guide. Then fire up the game, Alt-Tab out, and set the affinity for your game to the other core. You'll be able to run both the game and the server at the same time, with a negligible performance hit—amazing!

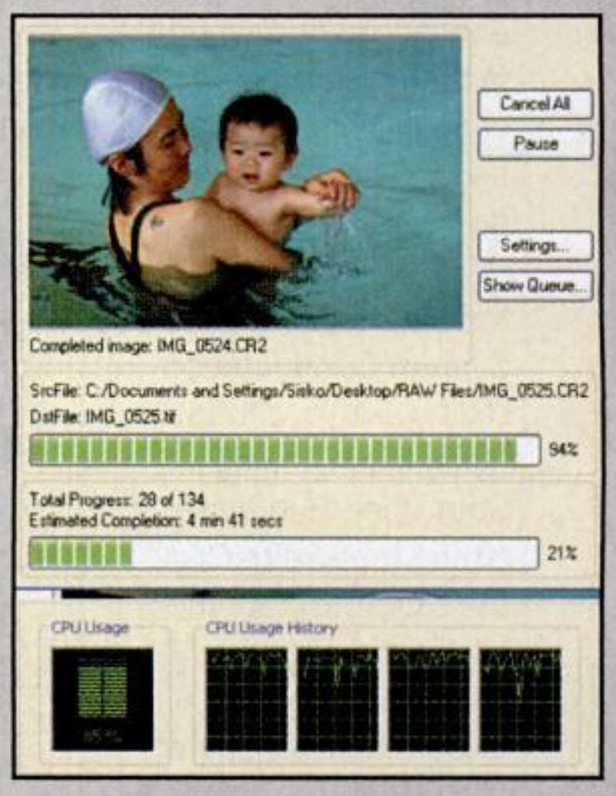
With a dual-core CPU, you can host a dedicated game server and run the game at the same time. Yes, way!

Keep Your Dual-Core Happy with the Right Diet

When Intel introduced Hyper-Threading in 2002, it was nearly impossible to find multithreaded applications outside the highly-specialized realm of workstation software. Today, multithreaded apps for home users are much more plentiful, and can give dual-core processors a healthy performance boost compared with their single-core cousins.

To get the most from your dual-core CPU, you need to run multithreaded applications. Here's a short list of applications we've found that run significantly faster on a dual-core system. All of them offer a healthy dose of multithreading, and some even scale to offer major performance increases on machines with four or more CPU cores!

- Adobe Premiere Elements 2.0
- Adobe Premier Pro
- Bibble Labs Bibble 4.6
- Ahead Nero Recode 7
- Quake 4 (with 1.1 patch)
- Call of Duty 2
- PictureCode Noise Ninja
- DVD Shrink
- Omnipage 10, 15
- Abbyy FineReader 8



Dream Machine 2005's four cores go to work in Bibble Lab's *Bibble 4.6* digital-photo converter. This app supports up to 16 processors when it converts your RAW photos to other formats!

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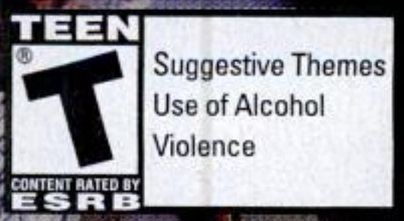

NCSOFT ARENANET

www.PlayNC.com

In Stores Now!

www.GuildWars.com

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Monthly Transfer Volume	500 GB	200 GB	500 GB
E-mail Accounts	1,000 IMAP or POP3	200 POP3	1,000 POP3
Mailbox Size	2 GB	2 GB	10 MB
Website Builder	12 Pages	✓	Freeware
Photo Gallery	✓	✓	✓
Dynamic Web Content	✓	✓	–
Web Statistics	✓	✓	✓
Chat Channels	✓	–	✓
Database	25 MySQL (Linux)	MySQL Support	25 MySQL (Linux)
Search Engine Tools	✓	Extra Charge Applies	$29.95/year additional
PHP Support (Linux)	✓	✓	✓
Perl Support (Linux)	✓	✓	✓
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THE $1,000 GAMING PC

Gaming PCs are usually ludicrously expensive—but not this one. Our hand-built rig rips through today's games and has plenty of room for upgrades, all for the price of a single Athlon FX-60 CPU!

BY JOSH NOREM

Month in and month out, we sing the praises of all-out, overclocked rigs of destruction fit for a prince. And you love it! And yet one of the most common requests we get from readers is for system configs that a pauper can afford. After all, not everyone has the financial means to build or buy a PC that costs as much as some cars.

This month we put our heads together and came up with the ultimate budget PC—for gamers. We set our budget crazy-low: $1,000. Consider this rig a 'tweener machine: It's got what it takes to play all of today's current titles, including *Quake 4, Doom 3, FEAR,* and *Battlefield 2,* at respectable frame rates and resolutions, but it also provides plenty of room for upgrades when next-gen games such as *Crysis* arrive late this year.

Building a budget PC is never easy, because you have to make compromises (something we bristle at, obviously). The key to satisfaction is to identify the system's primary purpose, and then spend as much as you can to bolster that one area of performance. Because we wanted a gaming PC, videocard and CPU performance were paramount. We went with midrange products, but because we chose a Socket 939, PCI Express motherboard, we've got plenty of upgrade options. Moving from one to two videocards is an obvious future step, and while AMD's top-of-the-line Athlon FX-60 costs $1,000 right now, by the time we'll need to upgrade, AMD will have moved over to Socket AM2 and FX-60s will be more affordable.

Still, there's no need to even discuss upgrades at this time, as this machine can handle anything today's game devs throw at it. Read on for details of the full config, the benchmark numbers, and the other budget-minded components we'd pair this rig with for a full PC build-out.

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THE $1,000 GAMING PC

Our Budget Badass

Sure, it's no Voodoo system, but this rig offers gaming muscle, upgradeability, and invaluable DIY pride

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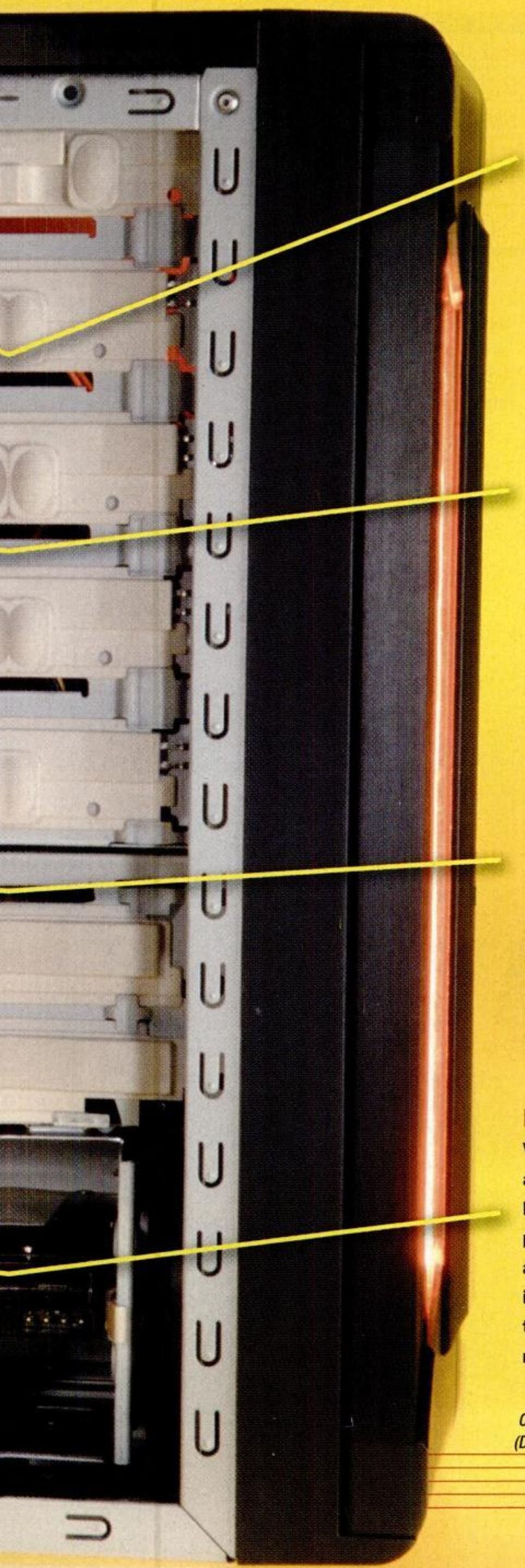
Case/PSU: Both of these components are awesome, despite the low price. Kingwin's case has ample cooling and is super easy to work in. We coupled it with Antec's SLI-capable 550W TruePower 2.0 PSU. The TruePower delivers more than enough power for our needs now, and it will still suffice if we add a second videocard.



Motherboard: The foundation for the whole shebang is Asus' excellent A8N-SLI Deluxe. This formerly high-end board can be found for an eminently affordable $110. It's SLI-capable, rock-stable, and offers plenty of overclocking options.

CPU: The brains behind the whole operation is AMD's Athlon 64 3700+. It rings in at 2.2GHz, which we overclocked to 2.53GHz (bargain-bin chips usually overclock quite well). With 1MB of L2 cache, it's certainly not gimped. We briefly considered going with a dual-core X2 3800+ proc, but at $300 it was just too pricey.

Videocard: Pumping the pixels is nVidia's new middleweight champion—the 7600 GT. This card impressed the hell out of us, besting the former budget champ—nVidia's 6800 GT—by a healthy margin. It's SLI capable, and doesn't even require external power!

Hard drive: The WD2500KS is a shoe-in for a budget box because it's blazing-fast at a low, low price. With 250GB of storage, a fat 16MB buffer, a SATA 3G interface, and cool operation, the only compromise we're making here is capacity.

Our optical drive arrived after the photo shoot (D'oh!); see the spec list for details.

The Specs

CPU: AMD Athlon 3700+
$230, www.amd.com

RAM: 1GB Corsair PC3200
$75, www.corsair.com

Videocard: nVidia GeForce 7600 GT
$225, www.nvidia.com

Hard drive: Western Digital Caviar SE 16 250GB
$110, www.wdc.com

Mobo: Asus A8N-SLI Deluxe
$110, www.asus.com

Optical drive: BenQ DW1655 w/LightScribe
$55, www.benq.com

PSU: Antec TruePower 2.0 550W
$115, www.antec.com

Case: Kingwin SK-523BKW
$55, www.kingwin.com

Total: $975

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THE $1,000 GAMING PC

Putting Our Penny-Pincher to the Test

All that cost savings wouldn't mean squat without the benchmark numbers to back it up

We performed some preliminary benchmarks during our videocard/CPU selection, so we had a pretty good idea where this rig would stand before we subjected it to our full battery of tests. Regardless, we're still impressed with our baby box. It handled everything we threw at it with aplomb, and ran *Quake 4* at 52fps, with 4x antialiasing and all options set to High.

The only rub to speak of is the resolution issue. We ran the tests at a mid-range resolution of 1280x1024, which is still a fairly common resolution these days. Heck, most 19-inch flat panels max out at 1280x1024! It wasn't a huge surprise, but gaming performance slowed to a crawl when we cranked antialiasing beyond 8x. Though the 7600 GT is very capable at modest settings, its slim 128-bit memory bus can't handle the bandwidth demands of high AA settings (more expensive cards have a wider, 256-bit memory bus).

Naturally, with an SLI-capable motherboard, one of the very first upgrades we'd make to this rig would be to slot in another 7600 GT for hot, sweaty dual-card action. In fact, we've done just that, running two 7600 GTs in SLI for kicks. Interestingly, when we first ran the SLI benchmarks, we had AA and anisotropic filtering turned off, and the benchmark numbers were exactly the same as if we had one card. In essence, what the second card brings to the table is the ability to crank up anti-aliasing and texture filtering, for vastly improved image quality.

BENCHMARKS

	SINGLE VIDEOCARD	DUAL VIDEOCARDS
DOOM 3 (FPS)	35.3	56.9
FEAR (FPS)	52	83
QUAKE 4 (FPS)	44.8	70.8
3DMARK06	3,026	4,926
3DMARK05	5,958	10,158

Real game tests were run at 1280x1024 with all settings on High and antialiasing set to 4x. 3DMark05 and 06 were run at the default setting needed to obtain an official score.

And the Rest of the Parts...

For the purposes of our budget, we focused solely on building a self-contained rig, assuming you'd use your current monitor, keyboard, mouse, and speakers with your new $1,000 rig. If you want to spec a full system, here are a few budget components that deliver great performance at a reasonable price.

LCD Monitor: Dell 1907FP

If there's another brand-new 19-inch LCD that offers all the amenities of Dell's 1907FP and costs as little, we certainly haven't seen it. The stylish, slim package sports the full range of ergonomic adjustments—height, tilt, rotate, swivel; includes four powered USB 2.0 ports; and, most importantly, provides solid screen performance. Folks, it's a steal. See our review on page 74.
$340, www.dell.com

Speakers: Logitech Z-5300,

When it comes to gaming speakers, you don't want bang for the buck, you want *boom* for the buck. And Logitech's Z-5300 can't be beat on that score: This THX-certified, 5.1-channel system cranks out 280 watts of power for a street price well below $150.
$135, www.logitech.com

Keyboard: Generic

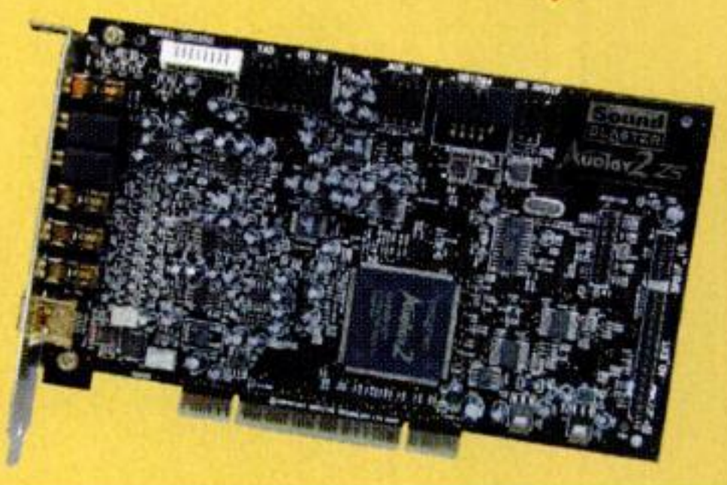
In our minds, there are "old" keyboards that don't have bells and whistles but work wonderfully. And there are "new" keyboards that cost twice as much and are littered with useless features like F-Lock keys, volume dials, and "shopping" buttons. Screw *that*. We'll take an old-school QWERTY board over that new junk any day. **$15**

Mouse: Logitech G5

The G5 is a mouse fit for a king—but at $50, any wage-slave can afford it. We love its adjustable-weight feature, its smooth-as-a-baby's-hiney laser tracking and its customizable precision. If you're on a *really* tight budget, we recommend Logitech's MX 518 mouse, which is just $35.
$50, www.logitech.com

Soundcard: Creative Labs Audigy 2 ZS

Our $1K PC uses onboard audio of the Realtek persuasion. It gets the job done, but doesn't produce what we'd call good, or even great, audio. For just $75, we can upgrade to the last-gen Audigy 2 ZS. This formerly high-end 7.1 card sounds fantastic, and is much cheaper than the costly X-Fi boards.
$75, www.creativelabs.com MPC



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Back Up Your Hard Drive

What invaluable data is on *your* hard drive? Wedding photos? Financial records? Your saved games from *Oblivion*? Here's how to preserve and recover those files in the wake of a disaster.

TIME 00:35 HOURS:MINUTES

Backing up the ol' hard drives belongs on that mental checklist we all maintain—the one titled "You Know You Should…." For most of us, data backup falls somewhere between "Floss Your Teeth" and "Call Your Mother." These are the things you know you need to do, but that you just keep putting off 'til *mañana*. You also know that it's inevitable that your procrastination will eventually bite you in the rump.

Before it gets to that point, download the free edition of 2BrightSparks' *SyncBack* software from **www.2brightsparks.com**, take 35 minutes, and follow this guide to backing up your hard drive. Floss your teeth while you're waiting for the backup to finish; and when it does, call your mother. She worries.

BY MICHAEL **BROWN**

1 Decide What to Back Up

There are two complementary approaches to backing up your hard drive: One is to create an "image" of the disk, and the other is to copy only selected files and folders. A disk image is a snapshot of an entire hard drive partition, less any empty sectors, and it includes the operating system, all your programs, and all your data. This can be useful, but it takes a lot of time and consumes an enormous amount of storage space. And if you're moving to a new PC, the image from your old one is likely to be useless because it will contain device drivers for hardware that might not exist on your new machine.

Disk images can be a life saver, though, if you experience a catastrophic failure and you don't want to go through the tedium of reinstalling and reconfiguring your operating system, application software, and all the device drivers your hardware requires onto a new hard drive. We recommend creating occasional disk images, using a program such as Symantec's *Norton Ghost*.

But it's even more important that you copy your data files—frequently—because you never know when disaster will strike. That's the approach we'll discuss here: using special software to make backups of all your documents, email, music, spreadsheets, videos, and so on; plus, any programs you've downloaded from the Internet.

Our backup method won't restore any apps you've already installed, so make sure you save your original discs, as well as any patches and updates that you downloaded. It's also important to store copies of all your licenses and serial numbers, should it ever be necessary to reinstall any of those programs. And don't forget to back up your backup software; you won't be able to restore without it!

Hard drive failure is a matter of when, not if. Don't tempt fate: Back up your critical data.

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2 Choose a Backup Destination

Once you've identified *what* you want to back up, you need to decide where you're going to back it up *to*. Avoid using media, such as CD-R discs, that will require you to span your backup (spread it across more than one piece of media). Spanned backups take much more time because they require your intervention—to swap discs—during both the backup and the restore processes. Instead, use media that can accommodate your entire backup without spanning. An external hard drive that can be stored off site—in a different building or in a safe deposit box—is an ideal choice; another alternative is to copy the files to another computer on the Internet using FTP.

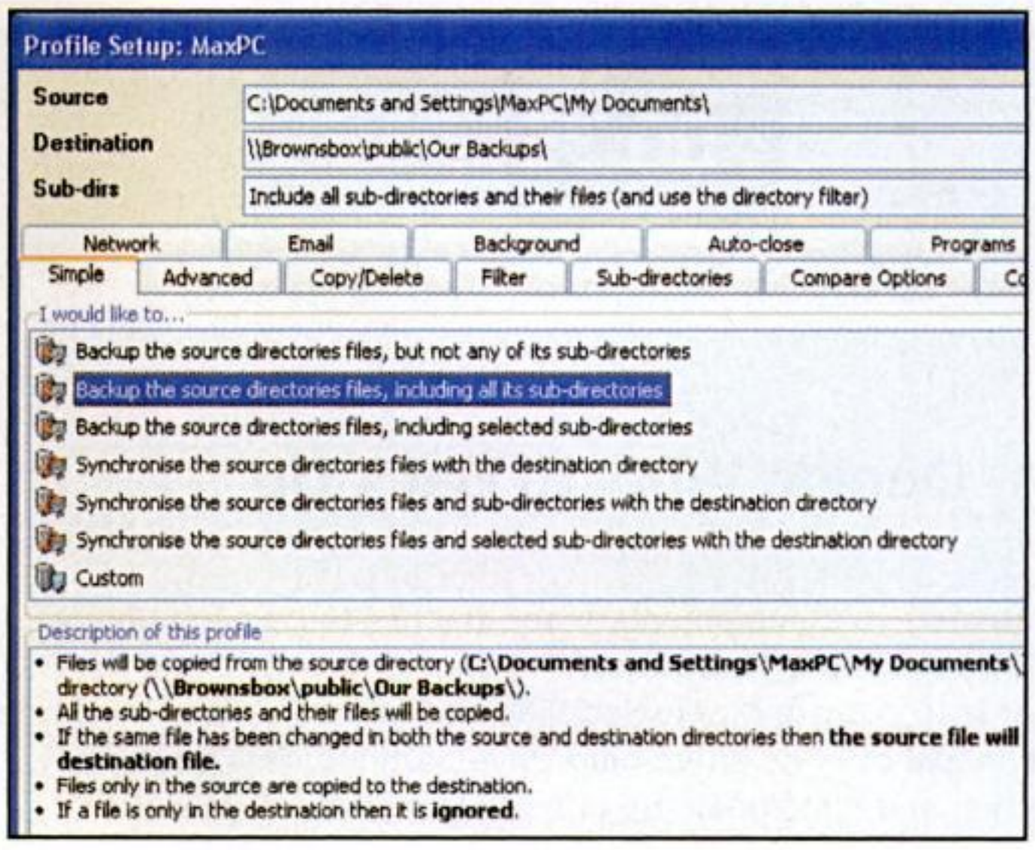
It pays to be paranoid: Creating more than one backup and storing each of them in different locations will provide added insurance in the event that both your original *and* your primary backups turn up missing, corrupted, or destroyed.

3 Create a Profile

The first time you run *SyncBack*, the software will ask if you wish to create a profile, which will appear in a toolbar the next time you run the software. Profiles give you one-click access to any customized backup and restore tasks you've created.

The freeware version of *SyncBack* offers two basic categories of profiles: Backup and Synchronization. A Backup profile does just what you'd think: It copies your files from one place to another. (Note: The freeware version of *SyncBack* does not perform *incremental* backups, a time-saving scenario in which only those files that have changed since the last backup are copied.) A Synchronization profile is useful if you regularly work on two PCs—a desktop and a notebook, for instance—and you want the data stored on each machine to mirror that which is stored on the other. For now, let's set up a Backup profile and assign it a name.

The next step is to choose source and destination directories. The source will contain the files you wish to copy, and the destination is where you want those copies stored. We recommend that you back up everything in your profile directory under C:/Documents and Settings, except the Local Settings folder. *SyncBack* defaults to backing up any and all sub-directories within the selected folder; click the Sub-dirs drop-down menu for other choices. If you'd rather back up to another computer on the Internet using FTP, click on the Expert Mode button and then the FTP tab. (Expert mode will reveal a host of other options, too).

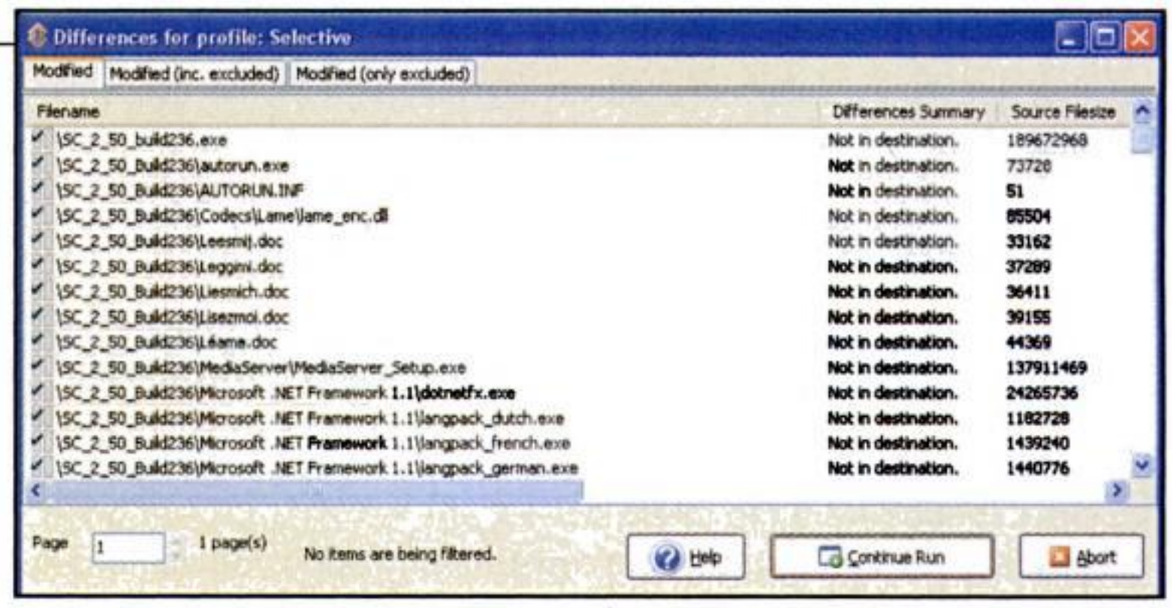


***SyncBack's* profile tool greatly simplifies the process of backing up your hard drive.**

4 Run Your Backup

Click the OK button and *SyncBack* will ask if you'd like to perform a simulated run for this new profile. Click No to skip this step this time (you might want to explore this feature later). Select your newly created profile and click the Run button. *SyncBack* will now present a listing of all the files that are about to be backed up. Click the Continue Run button to start your backup. Hover your mouse over the profile name and a pop-up window will display your progress. When the program is finished, a success message will appear in the Result column. Congratulations! You've just backed up your hard drive!

For your next trick, consider using *SyncBack* to schedule automatic backups; that way, you won't have to think twice about backing up your crucial data. Just remember to store your backups someplace other than your main drive, so you won't lose both your original files and your copies should your drive die.



After selecting your backup profile and clicking Run, *SyncBack* will present a list of all the files that match the conditions defined in your profile. Click the Continue Run button and your backup will commence.

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Recovering From Disaster

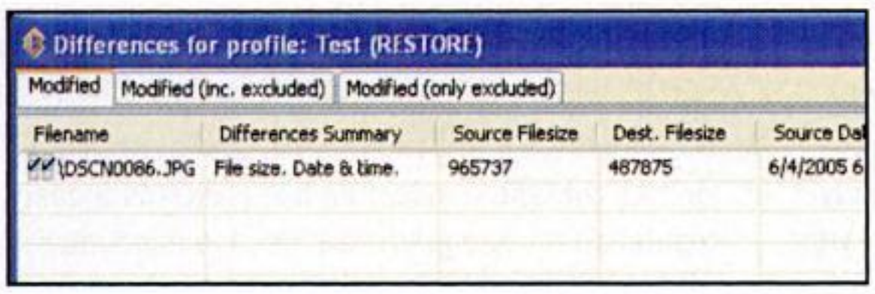
Let's say you fire up your PC one morning and the only noise you hear besides the fans whirring inside is an ominous clicking sound emanating from your hard drive. Your heart sinks into your stomach because you know your hard drive is toast. No worries, right? You backed up everything before you went to bed last night. You'll just fire up *SyncBack* and.... Oh, that's right, *SyncBack* requires Windows to run. Now what?

Assuming the rest of your PC isn't affected by whatever calamity has befallen your hard drive, you can replace the drive. If you've created an image of the old drive using a program like *Norton Ghost*, use that software to copy the image (and the working copy of Windows) onto the new drive, and then use *SyncBack* to restore the most current versions of your data files.

If you don't have a drive image, and you bought your PC preassembled, the manufacturer might have included a bootable recovery disc that can help restore even a new hard drive to your machine's initial configuration. If you built your own PC and you don't have a drive image, you'll need to reinstall Windows from scratch. In either case, you'll need to reinstall whatever other programs you've acquired in the interim—including, of course— *SyncBack*.

Restoring Your Files: Option One

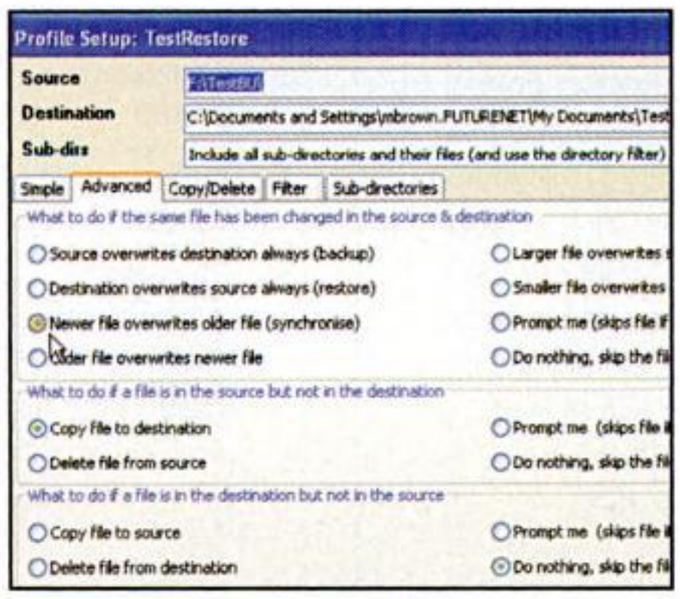
After you've launched *SyncBack* there are two approaches to restoring your backed-up data. You could simply open the same profile you used to create your backup and click the Restore button, but this is risky and not always possible, especially if your hard drive was totally wiped out. A Restore operation swaps the source and destination directories: Your backup becomes your source, and the hard drive you're restoring to becomes the destination. If there are versions of any files on your hard drive that are newer than those in your backup, it's easy to overwrite those newer files by mistake.



***SyncBack* will inform you when the files you're attempting to restore have the same names but different attributes as files in your destination directory.**

Restoring Your Files: Option Two

We recommend creating a new profile to use when restoring files, to ensure that only the latest versions of files are copied to your destination folder. Click the New button, choose Backup, and click OK. Give the new profile a name and click OK. This time, your Source directory will be the folder containing your backup, and your Destination directory will be the folder you're restoring to. Choose the same primary option as your backup file, but click the Advanced tab. Under the heading "What to do if the same file has been changed in the source and destination," click the button labeled "New file overwrites older file," and click OK. Ignore the warning message and click OK. Click the Run button and your restore will execute. MPC



The freeware version of *SyncBack* doesn't have a robust restore feature, but you can tweak its Synchronize feature to overcome that limitation.

Ask the Doctor

I GOT THE POWER

I am finally building my dream PC and am about to order all of the parts. I've chosen Gigabyte's GA-K8N Pro SLI mobo, but I will only be using a single PCI Express videocard to start. I have selected an Antec NeoHE 430 power supply, which has just one PCI Express power connector. Is it OK to use this power supply with my SLI motherboard, or am I forced to use an SLI-ready power supply?

—Brian Narby

Because you're going with an SLI motherboard, it's safe to assume that you eventually plan to buy a second GeForce videocard to run in SLI mode alongside it. If you go with Antec's NeoHE 430 power supply, you'll have to replace it with something more powerful when that time comes. Why not save yourself some money in the long run by choosing an SLI-capable power supply in the first place? nVidia tests various components—including power supplies—for suitability in SLI environments. You'll find a complete list of SLI-certified products at www.slizone.com/object/slizone2_build.html.

GHOST DRIVE

*I recently purchased and installed a Maxtor Model 6L250S0 hard drive, but my BIOS refuses to acknowledge that the drive is plugged in. I exchanged the drive once, because I thought it was defective, but I'm having the same problem with the replacement unit. I tried running the **Power Max** utility that Maxtor offers, and that won't detect it either. I'm running an Abit VT7 motherboard with the latest BIOS, a 3.2GHZ Intel Pentium 4, and 512MB of Corsair DDR 3200 memory. What's going on?*

—Carlos Conrique

As a general rule, any hard drive that has both its data and power cables correctly plugged into your PC should show up in the BIOS. It's highly unlikely that you happened to purchase two dead drives in a row, so this just might be a case of installer error. Don't worry, it happens to the best of us; in fact, the Doc is glad malpractice suits don't apply to him. In any event, here are the things you should look for:

Is the SATA cable securely attached to the port on the motherboard and to the back of the drive? SATA cables have a propensity to slip free if you so much as give them a sideways glance. Second, make sure the power cable is firmly seated. Third, check your BIOS to see if there's an option for enabling the SATA ports (they might be disabled by default). Fourth, determine if your motherboard needs SATA drivers. The south bridge in some older motherboards requires software support to enable SATA. (Note: if you're installing Windows onto the drive, press F6 during boot and install the drivers from a floppy disk.) If after all that, your BIOS still refuses to recognize the drive, the drive probably really is dead.

DON'T GO THERE

I've seen people make computer cases out of just about everything, so I was thinking about building a custom case for my own PC. My primary concern has to do with proper grounding. When you connect a mobo to the standoffs in a factory-made case, they're attached to metal. Is it really necessary to ground those little screw holes? I once mounted a motherboard in a cheap case and left one hole vacant because it didn't line up properly. When I started my PC, only two of my four USB ports were operational. What are your views on the subject?

—Kyle Sdasiznit

Thinking of fabricating your own case? If you don't have enough frustration in your life, consider marriage or switching to Linux. Seriously though, while it's certainly possible to build your own case, it would be extremely difficult to pull it off without spending an exorbitant amount of time and money; and quite frankly, it's not worth it. Cases are painstakingly designed to insure the motherboard is properly grounded and that everything fits together perfectly. Try it on your own and chances are you'll experience instability; or worse, you'll fry your components. And that's assuming you can acquire, cut, mold, and assemble the steel and aluminum you'll need; drill holes for the standoffs; cut openings for the optical drives; drill fan mounts; and so on.

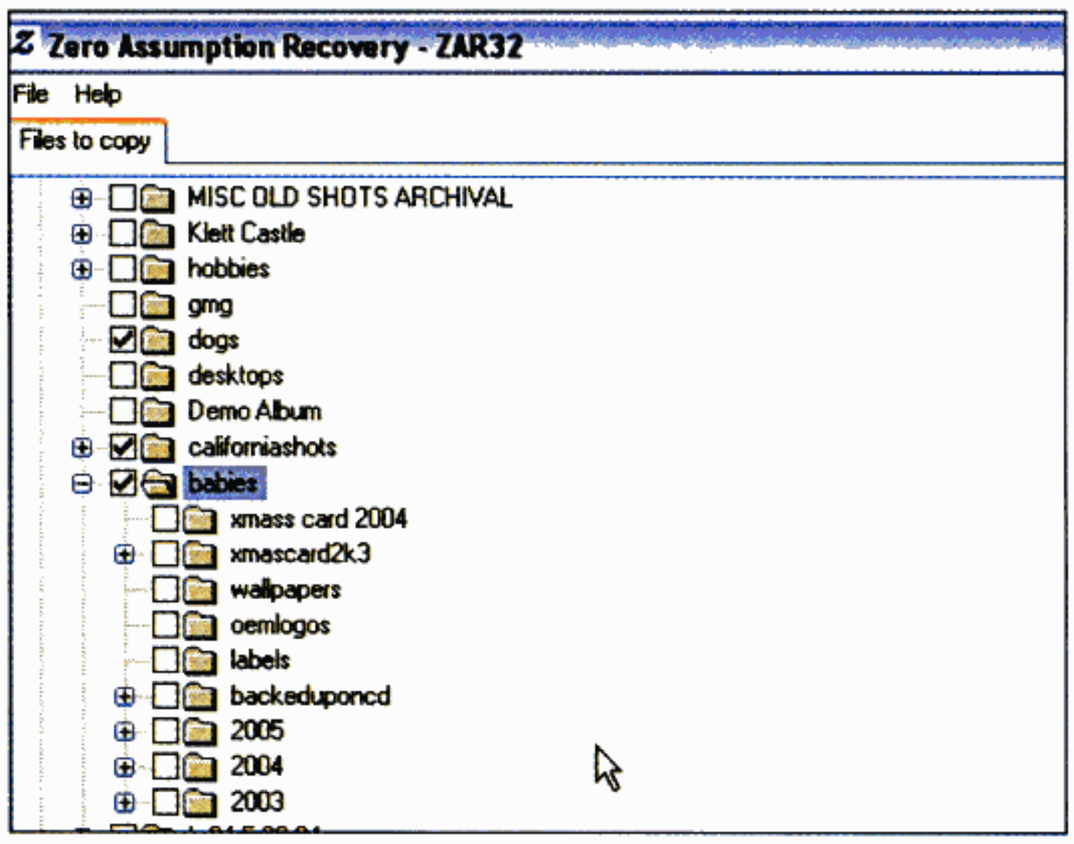
The Doc's all for case mods and wild "Rig of the Month" experimentation, but you might be better off buying a bare-bones case for $50 and customizing it to look like a DIY case. That would be much easier on the pocketbook, safer for your PC, and it'll probably look a heck of a lot better.

GIVING SPYWARE THE BIRD

*I've done everything I can to remove a program called **SpyFalcon** from my PC, and nothing has worked; in fact, trying to fix the problem trashed my system so badly that I ended up buying a new computer. I then installed the ruined hard drive in the new machine to salvage what I could. The drive shows up under disk manager, during POST, in the BIOS, and even in Windows' device manager, but I can't access it. Windows won't assign it a drive letter, and the only selectable option in Windows' disk management is Delete. I even tried plugging the drive into a system I built that I knew should be able to read the drive (it had many other times), but I encountered the same problem. Is there anyway I can retrieve my files, or am I SOL?*

—David Ratliff III

The Doc did a little research on *SpyFalcon* and he learned that the application has garnered a nasty reputation for being adware. He also encountered a version for PDAs, dubbed *SpyPigeon* (just kid-



***Zero Assumption Recovery* is a surprisingly effective data-recovery tool. The free trial version lets you recover up to four directories; you can unlock the full version for $100.**

Don't suffer in silence. The Doctor's medicine chest is brimming with curatives and he's accepting all new patients—with or without insurance. Just send an email to doctor@maximumpc.com describing what ails you.

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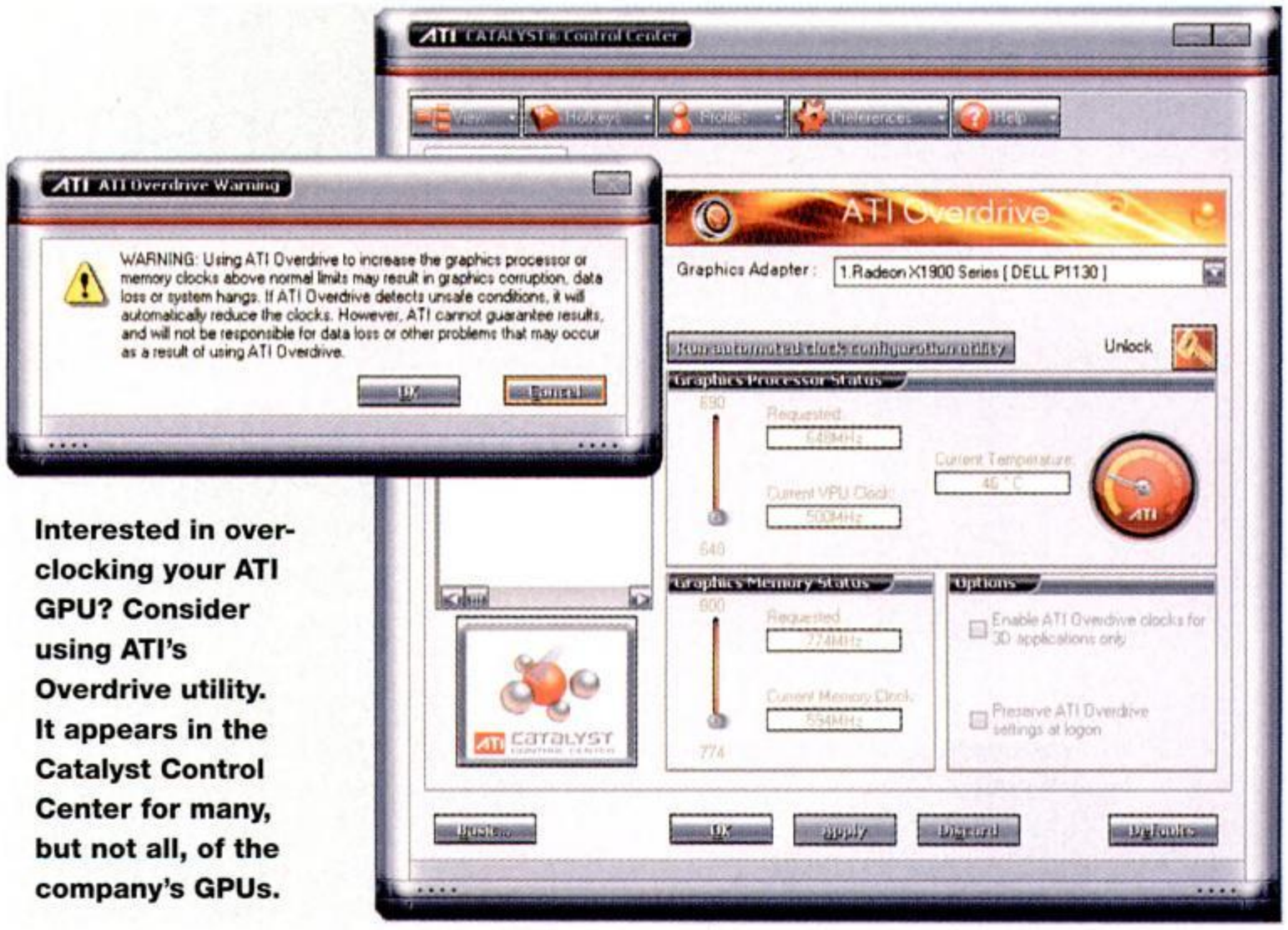
Ask the Doctor

ding). There's no space in this column to print the detailed instructions you'll need to remove *SpyFalcon*, but several websites can lead you through the process, including this one: www.spyware-removal-guideline.com/spyfalcon-removal.

As far as your drive is concerned, you should be able to recover the files as long they haven't been written over, but for best results, you'll need to buy some software, such as *Zero Assumption Recovery* (www.z-a-recovery.com). You'll find a how-to on the topic in the February 2006 issue of *Maximum PC*. Point your browser here for details: www.maximumpc.com/2006/02/how_to_recover.html.



Interested in overclocking your ATI GPU? Consider using ATI's Overdrive utility. It appears in the Catalyst Control Center for many, but not all, of the company's GPUs.

PATIENCE IS A VIRTUE

*I was experimenting with the **ATITool** overclocking utility to test my Connect3D Radeon X800 GTO card's capabilities. Using minor 4- to 5MHz jumps each time becomes a real pain after you reach about a 100MHz overclock, so I did something so stupid I regret it every time I turn on my computer: I jumped from 500MHz to around 600MHz or so and got a jumbled screen.*

*I rebooted and everything was all right until a couple weeks ago when I started up **Call of Duty**; after about an hour of play, I got a Catalyst VPU Recover message indicating that the graphics accelerator was not responding to graphics-driver commands. Do you think either the retailer from whom I bought the card or Connect3D will give me an RMA? If not, is there anything I can do to fix this problem?*

—Michael Fry

The primary rule of overclocking is similar to a pledge the Doctor made long ago: First, do no harm. Overclocking components can be dangerous if not practiced carefully and in moderation. You had the right idea to make minor and gradual tweaks to your videocard's core clock speed, but I'm afraid your impatience might have toasted your GPU when you boosted it 100MHz in one fell swoop. It's unlikely that ATI, the board manufacturer, or the retailer will issue an RMA for a board that's been cooked by overclocking, but it wouldn't hurt to ask; the worst they can say is no.

FISHING SCHEME

I'm a fisherman and I navigate with Lowrance's GPS and mapping software stored on flash memory (both SD and MD media). This software is fairly expensive, so I'd like to make working copies in case I drop one overboard.

*I tried using **Roxio** to back up the program to blank 128MB flash memory cards, but my GPS won't recognize the copies. I called Lowrance's customer support for help, but the tech refused to help and accused me of trying to make illegal copies that I could sell. You've published articles on how to make backup copies of other copy-protected media; do you know of any techniques for flash-memory cards?*

—Bob Skomra

Secure Digital (SD) derives its name from the fact that it can store data in encrypted form. This is accomplished using embedded crypto technology known as Content Protection for Recordable Media. The Doctor doesn't know if your GPS software is encrypted, but there should be no harm in trying to copy it this way: Insert the SD card into a reader connected to your PC and double-click the icon to open it. Click the Tools menu and select Folder Options. Click the View tab and choose "Show hidden files and folders." Click OK. Now drag all the folders and files to your desktop, replace the SD card with a blank one, and drag everything back.

If that doesn't work, you might try super-gluing a long leash to the edge of the card that's exposed when it's inside the GPS. Tie off the other end inside your boat; then you'll at least be able to retrieve the card if it falls overboard. If the contents wind up being destroyed by water, you can still prove to the publisher that you own a legal copy—it'll help support the argument that you're entitled to a replacement since they won't allow you to make a backup. MPC

SECOND OPINION

In your April 2006 column, reader Paul Lichenstein wrote that he couldn't get his Abit motherboard to go beyond POST, and that it repeatedly reported a "CPU has changed, go to setup" error message. Your advice to check his battery and BIOS settings was excellent, but I think his problem might actually be related to his power supply. I do computer repair on the side, and I've experienced this exact problem at least three times. What's happening is that during a cold boot, the PSU is dropping the voltage supplied to the CPU, and the BIOS is interpreting this as an indication that the CPU is different from the one stored in its settings.

—Rick Falzone

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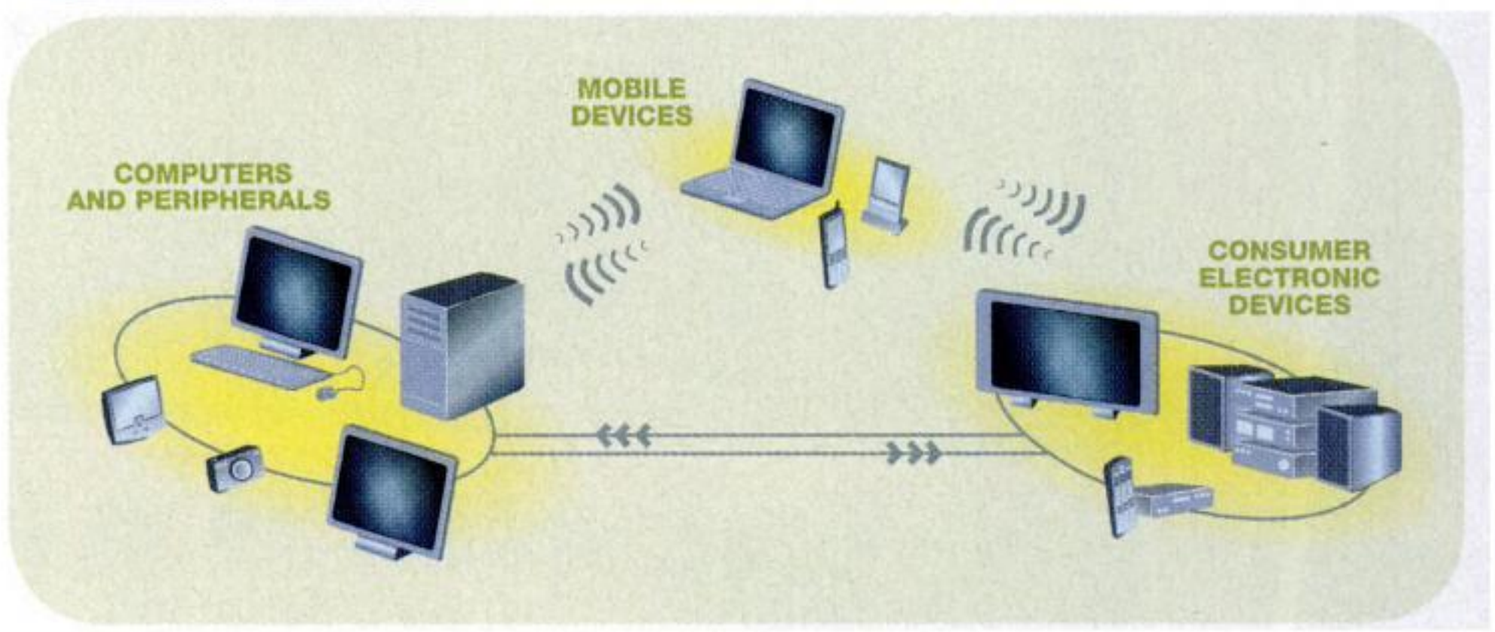
White Paper: DLNA Home Networks

Getting PCs and consumer-electronics devices to work together can be a major pain. Here's how the Digital Living Network Alliance (DLNA) plans to integrate these technologies once and for all

BY MICHAEL **BROWN**

HOW IT WORKS **DLNA connects disparate devices**



▶DLNA provides a common language that makes it easy for your PCs, cellphones, and portable media players to communicate with your home theater and other consumer electronics gear.

The DLNA is a consortium of nearly 300 companies in the computer and consumer electronics industries, including Microsoft, Sony, HP, Nokia, Philips, Kenwood, Cisco, Toshiba, and Samsung. As the DLNA sees it, every piece of today's home-entertainment gear exists on one of three isolated islands: PCs and the Internet, home-theater and hi-fi, and mobile devices ranging from MP3 players to cellphones. None of the products can easily communicate across categories with each other, and where communication *is* possible, the consumer is typically required to buy and configure a fourth category of product: a media bridge.

Think about how dumb that is. You don't need a black box between your DVD player and your home-theater system; you just plug the player into your A/V receiver or TV and it works. Integrating PCs, MP3 players, digital cameras, and the like into your home-theater system? Not so easy. And sending media the *other* direction is even more problematic. It can be done with today's technology, but you need streaming boxes and docking devices to bridge the islands—not to mention a whole menagerie of remote controls. All too often, these intermediary devices are designed by companies with expertise in either A/V *or* networking, but rarely both.

THE SAME, BUT DIFFERENT

What the DLNA proposes is a new type of network that's optimized not just for zipping bits from one PC to another, like a corporate LAN, but also to encompass consumer electronics. The goal is to simplify the distribution of digital media throughout the home, as well as to render it accessible from just about anywhere, using any digital device. If your network was entirely DLNA compliant and you had a DLNA-compliant cellphone, for instance, you'd be able to view digital photos stored on your NAS box or watch videos recorded on your network-attached DVR from anywhere you had cellular service.

One thing the DLNA proponents don't intend to do is reinvent the wheel. The methodology for routing digital media and control signals across the network as described in the DLNA network spec is already ubiquitous in the PC market: TCPIP over Ethernet or Wi-Fi. What distinguishes DLNA-compliant devices is that each is capable of interoperating with the other over a network. A/V receivers can stream digital music stored on any hard drive on the network, for instance, and TVs can do the same with video.

And because a DLNA-compliant network uses the existing Universal Plug and Play (UPnP) device-control protocol framework, any device from any manufacturer that's added to the network will be capable of not only automatically configuring itself, but also discovering the presence and capabilities of other devices on the network and automatically working with them.

DLNA TOPOLOGY

From a topological perspective, most DLNA-compliant networks will have a PC or an advanced set-top box at their hub. This central device will manage and distribute digital content among two broad classes of products: digital media servers (DMS) and digital media players (DMP). Some devices will, of course, be capable of both functions. Version 1.0 of the DLNA Interoperability Guideline is focused exclusively on networked entertainment devices involving imaging, audio, and video. The group plans to expand its specification to include home automation (lighting, HVAC, video surveillance, and so on) and telecommunications (the cellphone scenario described above) in the future.

DMS devices will be capable of acquiring, recording, and storing media to and from a variety of sources on the network. They'll also be responsible for enforcing any digital rights-management constraints that have been placed on the media (more on that topic later). Desktop and notebook PCs, advanced set-top boxes, digital cameras and camcorders, NAS boxes, and multimedia mobile phones are all examples of potential DMS devices.

DMP devices, meanwhile, will enable the end user to navigate and play digital media stored on your network. Examples of DMP devices include TV monitors, home-theater systems, gaming consoles, digital media adapters, and PDAs. The server will host the media, but the player will control and ultimately render it, using the network as a conduit.

Here's an example: You're sitting in front of your TV (a DMP) and you want to view a set of digital photos stored on your PC (a DMS). Using your TV remote as a controller and your TV as a display, you send a request over the network to your PC, browse the contents of its hard drive, locate the collection of photos you

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want, and initiate a slide show with software running on the PC.

According to the DLNA's interoperability standard, the end-user experience should be seamless: Each device on the network should not only recognize the presence of every other device on the network, it should also be able to identify its function and its capabilities (via UPnP). Each of these devices must then be able to communicate and exchange meaningful information with each other. Any DMP must be able to receive data from any DMS. If the DMP is unable to play the media in its native form, the DMS must transcode the material on the fly to a format that the player is capable of playing.

BRILLIANT! WHAT'S THE CATCH?

The DLNA network is an attractive concept with the potential to solve many of the problems associated with integrating PCs and consumer-electronics devices. It's a good first step, but we see two significant flaws with this initial implementation.

First, it seems the DLNA has decided to punt on the issue of digital rights management, at least for the time being. The consortium's stated position is that they recognize the rights and expectations of both media producers and media consumers, including the concept of fair use. But that's as far as Version 1.0 of the DLNA's Home Networked Device Interoperability Guidelines go. In other words, a device can earn its DLNA compliancy logo whether or not it's capable of streaming or playing DRM-encrypted media.

Second, the consortium needs to expand the narrow universe of media codecs that DLNA-certified equipment is required to handle. To earn its logo, a device need only support two of each type of the following image, audio, and video file formats: JPEG, plus PNG, GIF, or TIFF; LPCM (e.g., WAV files from an audio CD), plus AAC, AC-3, ATRAC3plus, MP3, or WMA9; and MPEG-2, plus MPEG-1, MPEG-4, or WMV9. Each device can, of course, support *more* than two of each type of file format, but some scenarios—say, MPEG-2 is the only video file format the server and player have in common—will choke today's wireless networks.

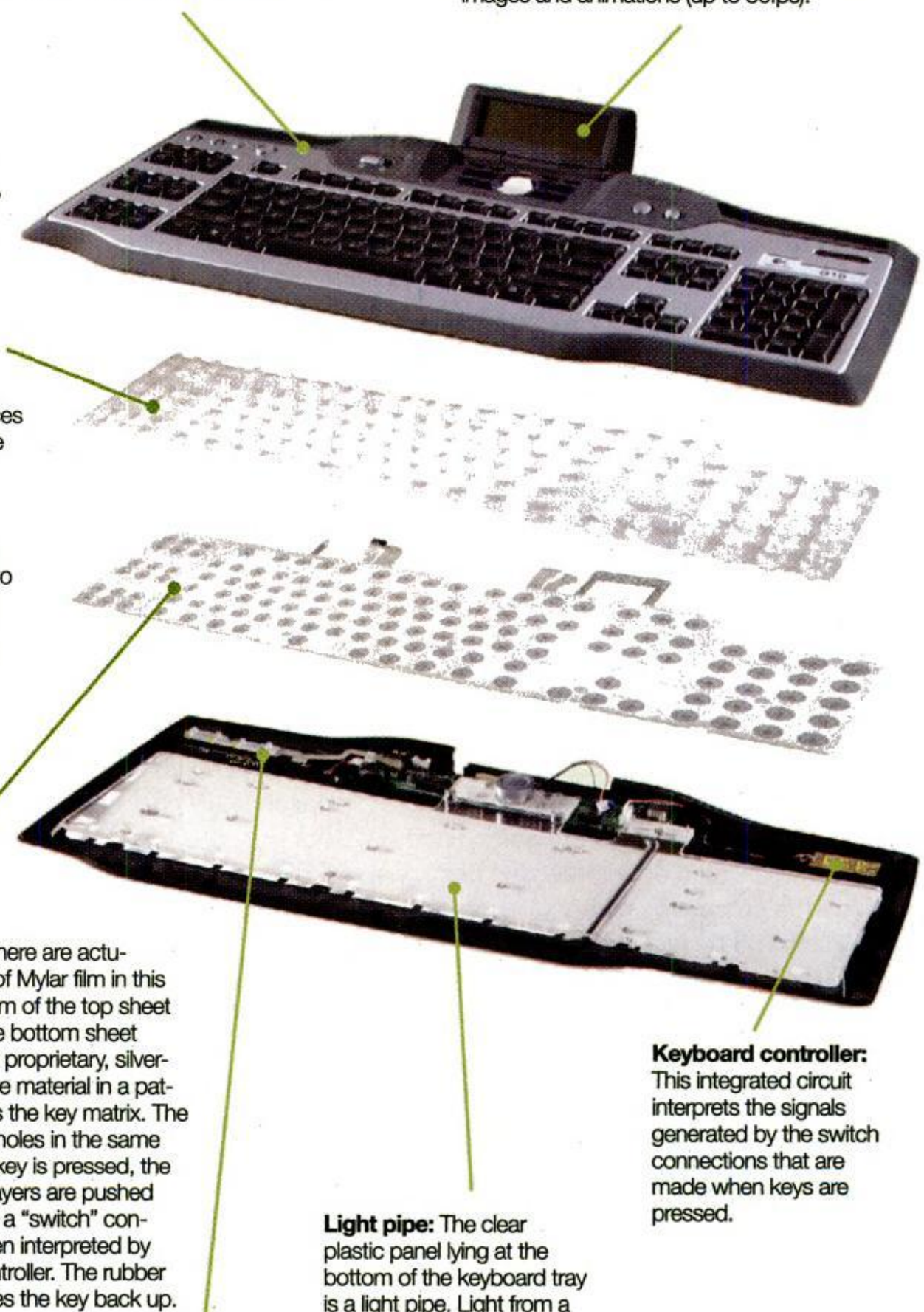
Fortunately, the DLNA consortium has all the right participants to resolve these issues. With DLNA-certified products—including Buffalo's LinkStation Home Server and Denon's AVR-4306 home-theater receiver—now trickling onto the market, this space bears watching. Point your browser to **www.dlna.org** for more information. MPC

Gaming Keyboard

Keyboards contain more moving parts than all the other components in your rig combined. Most computer users—and this goes double for gamers—punish their keyboards with regularity. To see what enables them to stand up to such beatings, we dismantled Logitech's G15 gaming keyboard.

Keyboard shell: The keyboard shell, and the keys themselves, are manufactured from injection-molded ABS plastic, an incredibly tough but lightweight material.

LCD: This four-inch wide, one-inch high LCD panel offers 160x43 pixels of resolution. It's capable of displaying up to five lines of text with 26 characters per line, and it can be programmed to display grayscale images and animations (up to 30fps).



Rubber membrane: In the "old" days, keyboards had individual springs beneath each key. This design delivered marvelous tactile feedback, but it rendered the devices relatively expensive to manufacture. Replacing the springs with this rubber membrane enabled Logitech to add new features, such as the LCD, without driving up overall costs.

Mylar sheets: There are actually three sheets of Mylar film in this image. The bottom of the top sheet and the top of the bottom sheet are printed with a proprietary, silver-based, conductive material in a pattern that matches the key matrix. The middle layer has holes in the same pattern. When a key is pressed, the two conductive layers are pushed together to make a "switch" connection that is then interpreted by the keyboard controller. The rubber membrane pushes the key back up.

USB hub/LCD controller: This integrated circuit is both a two-port USB hub and a controller for the LCD. The keyboard draws a maximum of 500mA from the host PC, which limits the usefulness of its two USB ports.

Light pipe: The clear plastic panel lying at the bottom of the keyboard tray is a light pipe. Light from a series of LEDs is channeled through it in order to backlight the individual keys. The white film beneath the plastic ensures that the light is evenly distributed.

Keyboard controller: This integrated circuit interprets the signals generated by the switch connections that are made when keys are pressed.

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We Build Our New Zero-Point Rigs

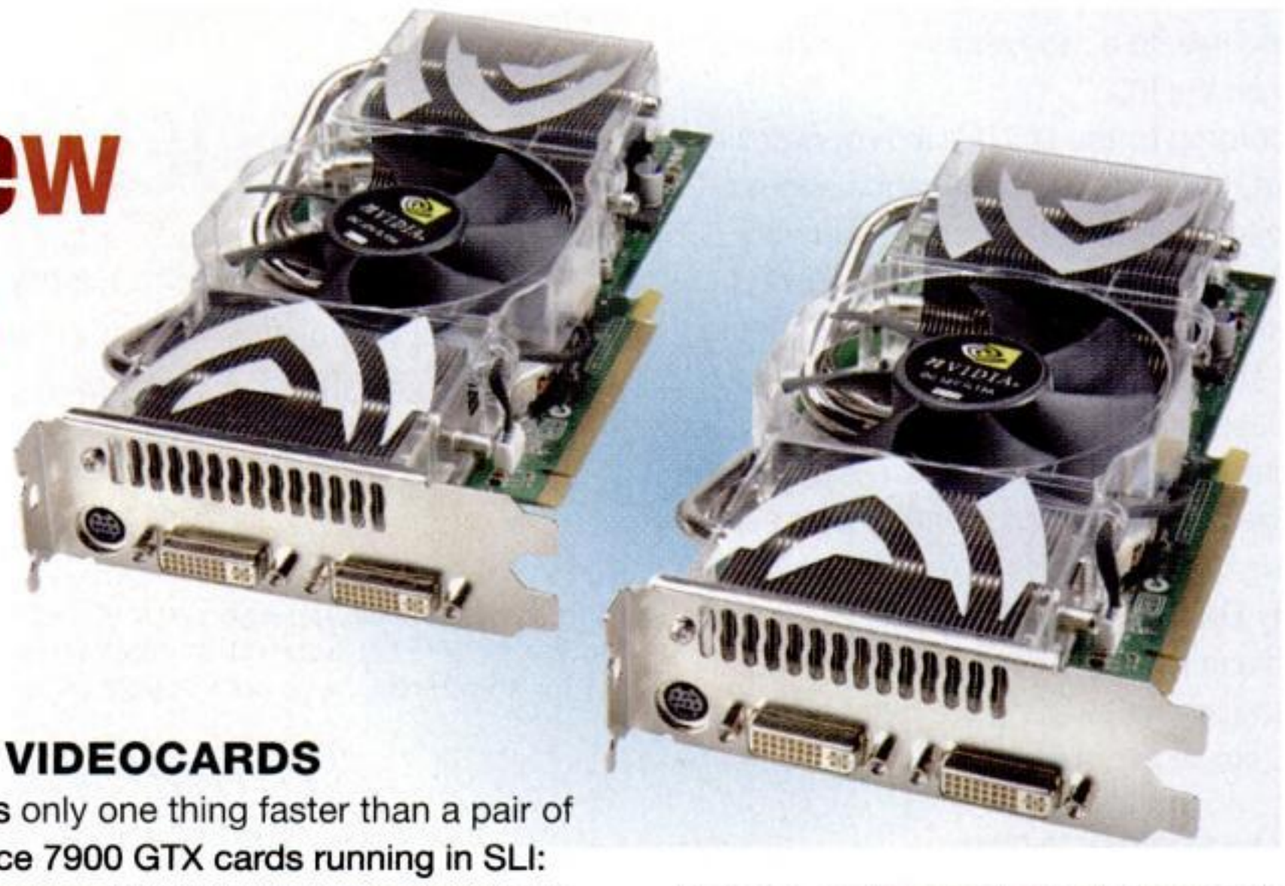
When we built our last round of zero-point systems in April 2005, using Athlon 64 FX-55 procs and GeForce 6800 Ultra cards in SLI mode, we thought these ultimate gaming rigs would be too long a yardstick for measuring other systems. Boy, were we wrong. Within six months, review systems were racing past our zero-point at warp speed. So while it sounds crazy to upgrade from an Athlon 64 FX-55 system, we're long overdue.

When sketching out the new system, we faced the classic upgrader's dilemma: With AMD's new DDR2 processors on the way and Intel's Conroe ready to come ashore, anything we built now would be outdated in weeks, not months. In the end, we decided we just couldn't wait any longer. In another month, the review systems' performance bars would be so much longer than our zero-point system's, we'd have to run a centerfold just to accommodate their Holmesian length.

THE CPU

In 2003 we made the switch from Intel to AMD with some trepidation. It was, after all, an untested platform and CPU. Sure it was fast, but would it hold up over time? Now almost three years later, we're damn happy with our decision. For our new test beds, we double the computing power of our previous 2.6GHz FX-55 by moving to the dual-core 2.6GHz FX-60.

AMD's Athlon 64 FX-60 features two 2.6GHz cores in one CPU and is the fastest proc on the market today.



THE VIDEOCARDS

There's only one thing faster than a pair of GeForce 7900 GTX cards running in SLI: four GeForce 7900 GTX boards running in quad SLI. Because we're not building our zero-point systems for ultra high-resolution gaming, however, the twosome is fast enough. While ATI's CrossFire cards are attractive on some levels, we're not comfortable going with the immature CrossFire motherboard platform.

To keep review systems from lapping our zero-point rig, we picked the fastest videocard config you can get today: two GeForce 7900 GTX cards in SLI mode.

THE MOTHERBOARD

Technically, we could have used our original Asus A8N-SLI Socket 939 boards, but we decided that having the nForce4 SLI x16 chipset with a pair of true x16 PCI Express slots was worth the trouble of yanking out the old mobos. It was only natural that we'd upgrade to the Asus A8N32-SLI boards. To reiterate what we said above, we just aren't ready to embrace nascent ATI chipsets yet; our zero-point not only has to be a reliable comparison for review systems, but also a solid platform for testing the majority of hardware and software that comes into the Lab.

THE POWER SUPPLY

A major graphics vendor recently told us that the weakest link on the PC today is the power supply. We have to agree. That's why we went with PC Power and Cooling's 850W monster. These PSUs are certainly not quiet, but we've never had a power problem with the brand, and judging by these beasts, we don't ever expect to.

THE MEMORY

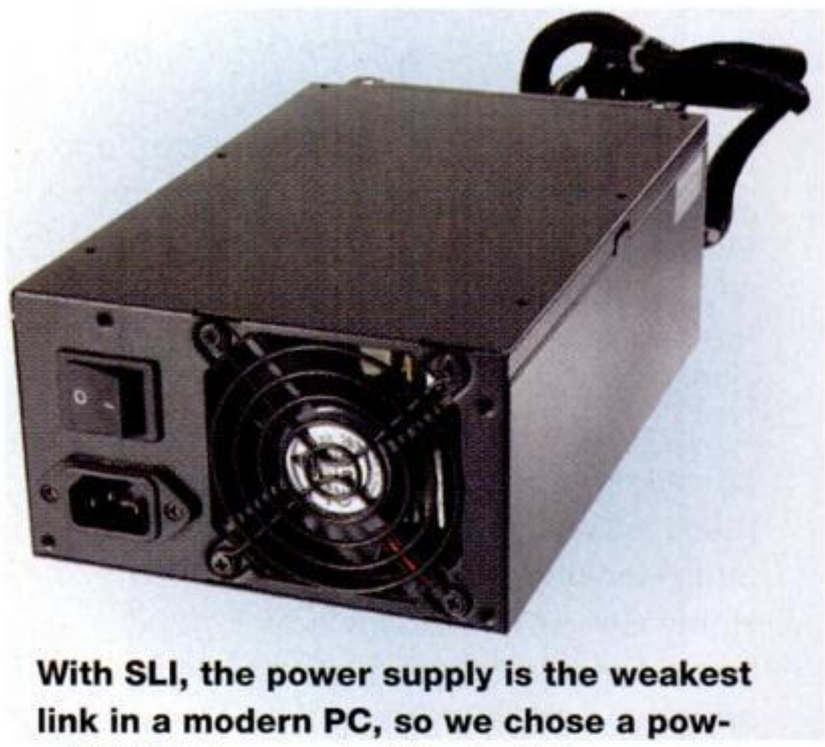
Despite rumors of a DDR500 speed bump, DDR400 ended up being the official end of DDR SDRAM. Fine by us. DDR2 performance has been pretty ho-hum, thanks to the spec's higher latencies. We slapped in 2GB of Corsair's DDR400 to replace our Crucial DIMMs, which have been horribly battered and bruised by editors who continually yank out RAM before fully discharging the system. This means you, Josh.

THE HARD DRIVE

We debated whether to use a single Western Digital 150GB Raptor drive or its sibling, the slightly slower, but much larger 400GB WD 4000KD. Granted, the 4000KD doesn't sport SATA 3G, but that has no impact on its performance.

THE SOUNDCARD

What would our zero-point be without a Sound Blaster? If you're not convinced that a good soundcard matters, you need only play *Battlefield 2* with Sound Blaster's X-Fi soundcard and a set of quality headphones to be thoroughly persuaded. You'll never be satisfied with onboard audio again.



With SLI, the power supply is the weakest link in a modern PC, so we chose a powerful PSU for our test bed: PC Power and Cooling's Turbo-Cool 850.

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How We Test

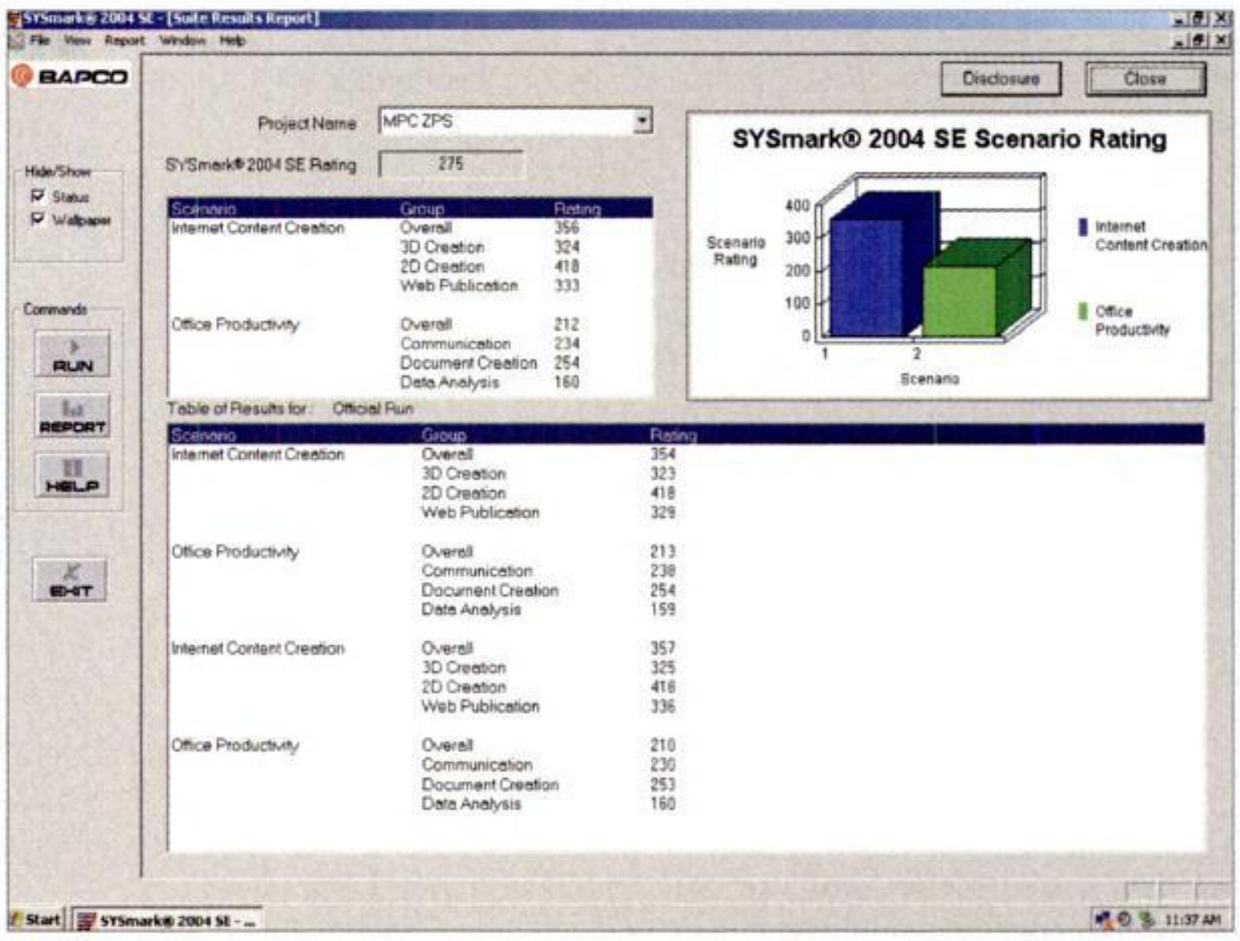
Our new benchmarks stress real-world applications over synthetic performance

We've always preferred real-world tests to measure PC performance. By using common games and applications, we feel that our tests give readers a more realistic picture of a machine's abilities. It's no secret that vendors tune their drivers and tweak their hardware to meet the demands of various benchmarks. It's a great thing if they're tuning for real-world apps, but it has little value to the consumer if they tune for a synthetic benchmark—and in the past, tuning for synthetic tests has even hurt performance in games and apps.

Our latest system benchmarks adhere to our "real-world" philosophy, and even kick it up a notch. Trying to find real-world tasks that stress the capabilities of a dual-core SLI rig isn't easy. Sure, we could run some ridiculous 3D render or esoteric test that calculates pi to 100,000 decimal points, but these don't have much practical value. We wanted to address chores that truly are issues for real users, such as editing high-definition home movies. (HD cameras might be too pricey for a lot of folks now, but they'll soon be under $900, so expect to see more high-def cams at Disneyworld.)

We've also added a few more tasks to our *Photoshop* test, and we start with a RAW file (we used to begin with a high-resolution JPG file) to simulate what a digital photographer might do. Additionally, we compress a movie for playback on a PSP, using *Nero Recode*; and measure OpenGL and DirectX gaming performance at fairly high resolutions.

We think our new benchmarks are a good measure of the performance a typical Maximum PC should deliver.



A score of 275 in BAPCo's *SYSmark2004 SE* means the performance is almost three times that of a 2GHz Pentium 4 box.

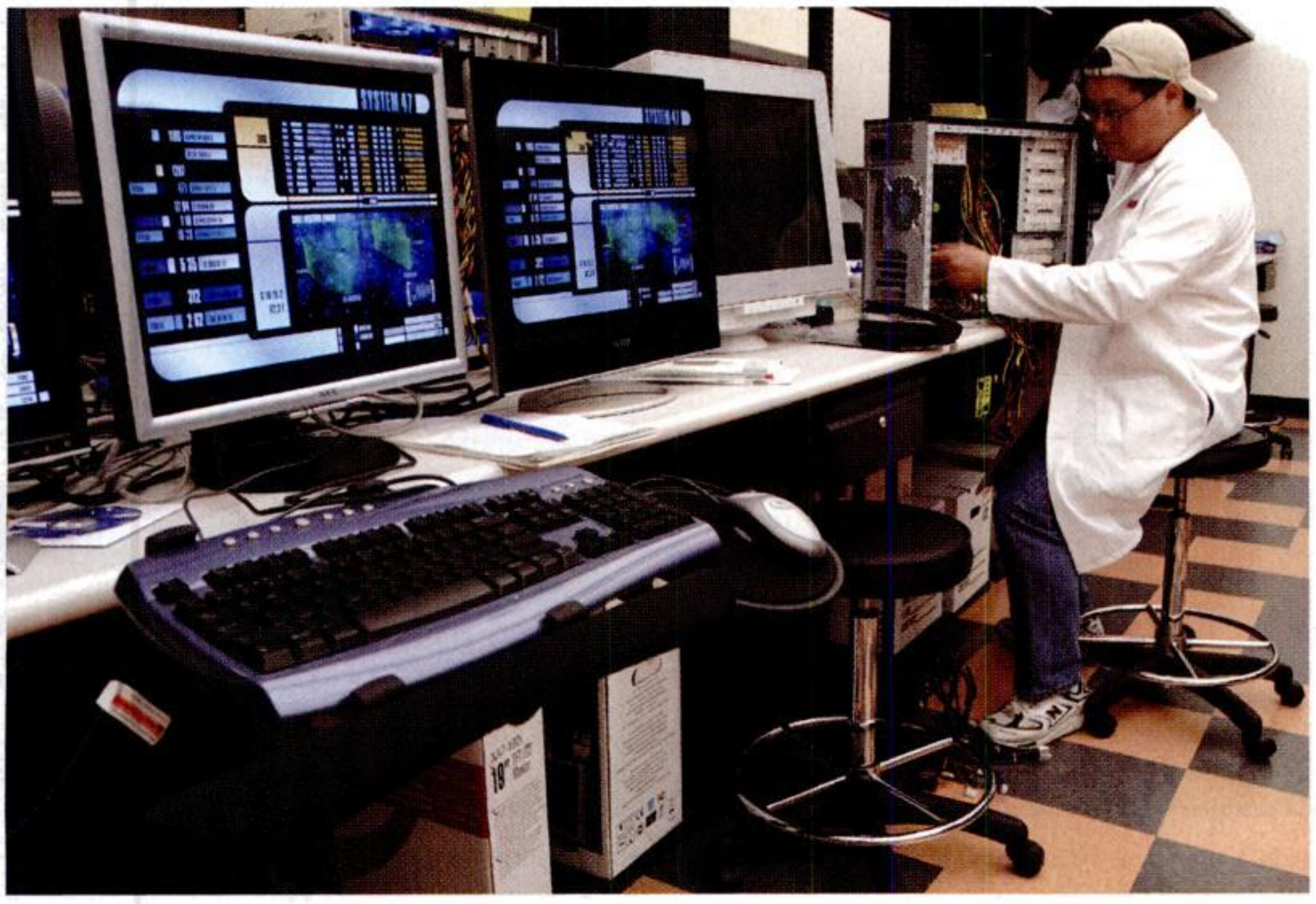
SYSmark2004 SE

Some people might call *SYSmark2004 SE* a "synthetic" test, but they'd be wrong. If anything, *SYSmark2004 SE* is as real-world as you can get. The benchmark suite uses 19 mainstream applications to simulate real-world office and content-creation tasks.

Unlike tests that isolate and measure the time it takes to complete a single task in a single application, *SYSmark2004 SE* measures the time it takes from the issuance of a command until the test app actually does something and the system responds. In other words, *SYSmark* measures how long you spend waiting on your computer. Both the 2004 and SE versions contain very few multi-threaded apps (beyond Discreet's 3D modeling application *3dsmax*), but the program runs several apps at one time, so dual-core CPUs perform better than single cores.

We've used the previous version, *SYSmark2004*, for many years. The SE version adds support for 64-bit OSes. (Unfortunately, fundamental changes to the app make it impossible to compare scores from *SYSmark2004 SE* and *SYSmark2004.) SYSmark2004 SE* is calibrated based on the performance of a 2GHz Pentium 4 Northwood system using an Intel 845 chipset, 512MB of DDR266, an 80GB 7,200rpm IBM hard drive, and an ATI Radeon 9700 Pro. This configuration achieves a score of 100. Our zero-point system's score of 275 therefore indicates that it's 2.75 times faster than a 2GHz P4 box. Thanks to its well-rounded nature, *SYSmark* stresses the CPU, hard drive, RAM,

Continued on page 64→



Our new zero-point systems and benchmarks are the perfect complement to our spacious new Lab.

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Continued from page 63

and chipset performance. A shortfall in any of these areas will impact performance in the benchmark.

Adobe Premiere Pro 2.0

We're finally tossing out our ancient *Premiere* test (originally created in *Premiere 6.0*) for something that stresses today's power rigs. To build our new test, we used a Sony HVR-Z1U Pro to shoot a few scenes at 1440x1080. We then add titles, transitions, overlay video, special effects, and a soundtrack in WAV format.

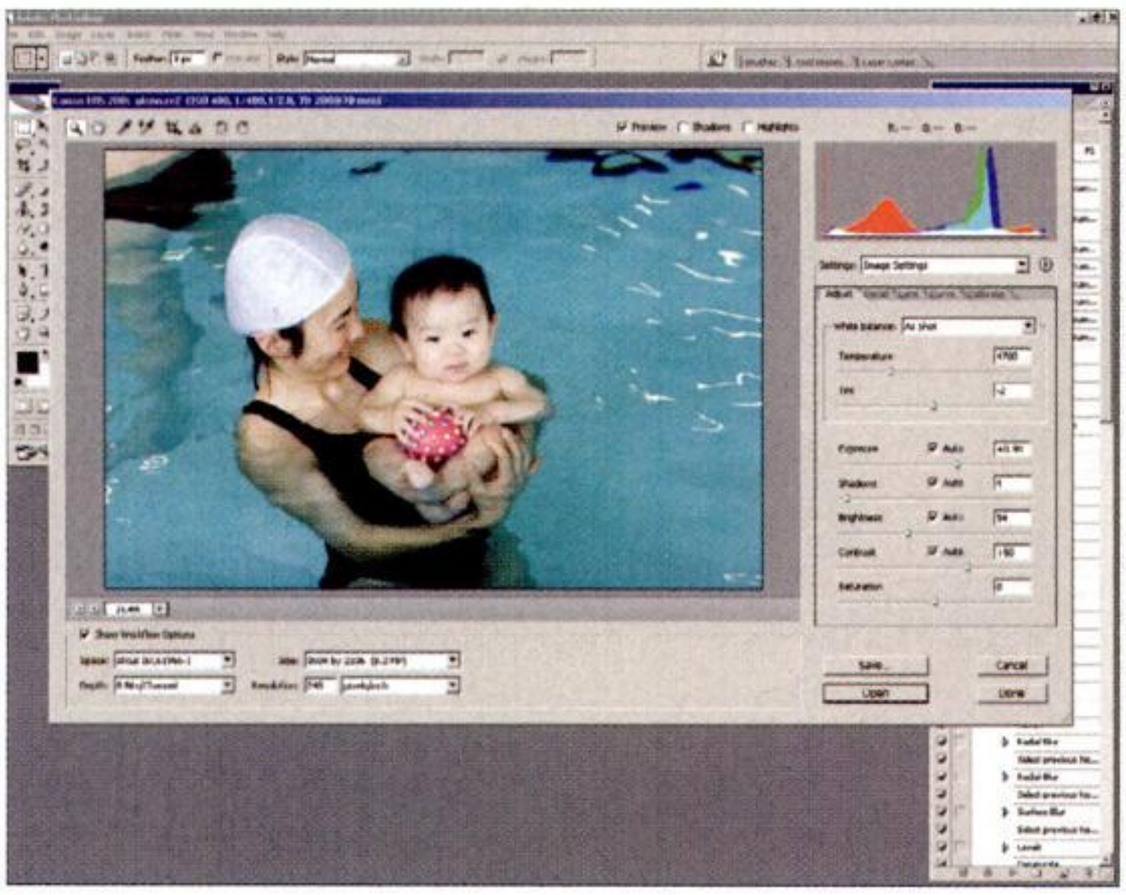
We encode the short video to *Windows Media Video 9* at 720p resolution, using the Adobe *Media Encoder*. *Premiere Pro 2.0* is actually the third iteration of the *Premiere Pro* engine, which better supports multiple processor cores and Hyper-Threading. *Premiere Pro 2.0* even uses the graphics card to render some effects and transitions.

Our *Premiere Pro* benchmark remains primarily a CPU test. While our older test tended to favor the Pentium 4 microarchitecture over the Athlon 64, we found that AMD and Intel CPUs perform about the same in our new test. A 3.46GHz Pentium Extreme Edition 955 was no faster than our Athlon 64 FX-60. Both Intel and AMD CPUs run slow, but adding a second core helps a ton. Our zero-point system turns in a score about 40 percent faster than the single-core $1,000 PC we built for this issue (see page 46). Not too shabby when you consider that the pure clock differences between the CPUs are about 400MHz.

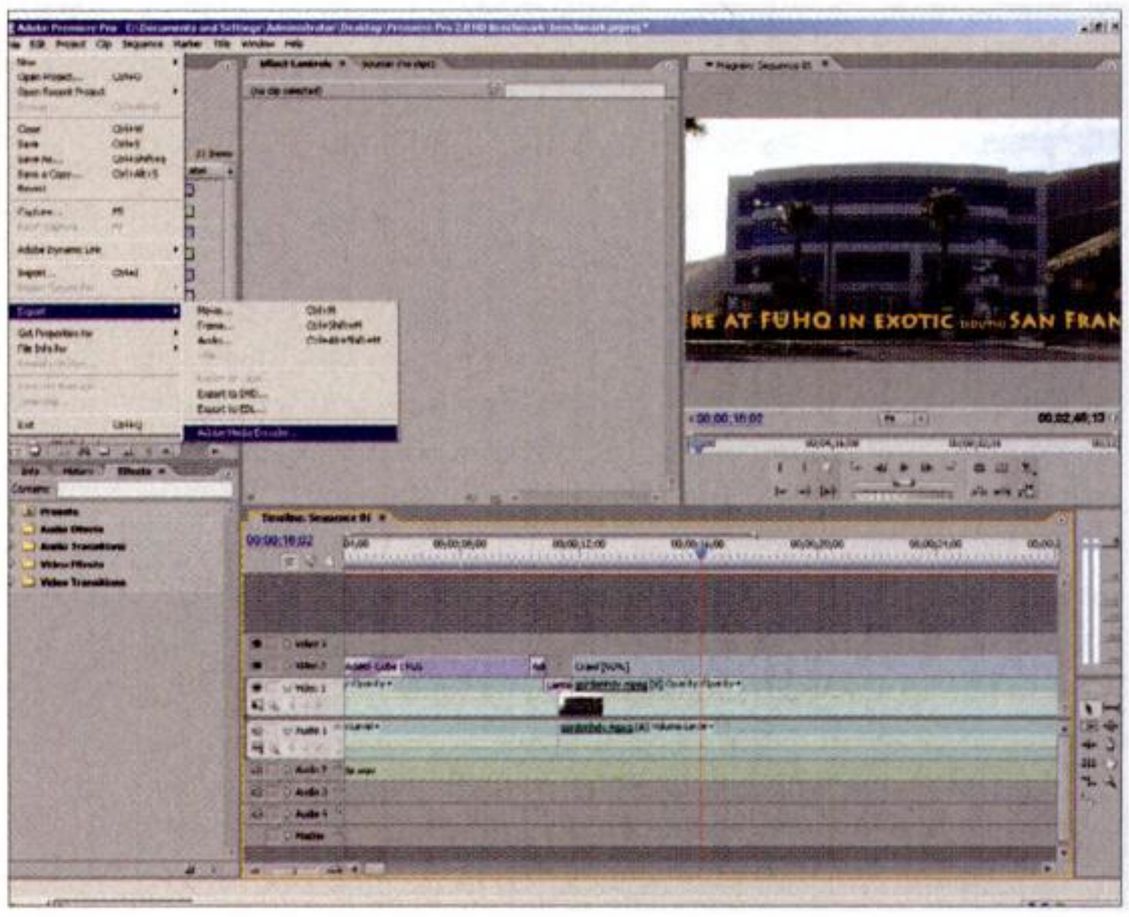
Either way, the test is brutal. The final video is just 2 minutes, 46 seconds long, but the process of rendering and encoding takes almost an hour with the fastest desktop machines available. Because most home movies of your baby or cat will likely be an hour or more in length, this is one area where you can't have enough speed.

Adobe Photoshop CS2

We're also jettisoning our old *Photoshop* script in favor of a new, even more devastating routine. Our *Photoshop CS2* test starts with an 8.2MP image taken with a Canon EOS 20D in RAW format. We then apply nearly every filter available in *CS2* as well



Our new *Photoshop CS2* test script starts with a RAW file from a high-end digital camera, to push the PC harder than a mere JPEG would.



We've moved from editing standard-definition digital video to a high-def source, using Adobe's new *Premiere Pro 2.0*. To really push the hardware, we include a punishing number of transitions, effects, and video overlays.

as other common *Photoshop CS2* functions. The entire test takes about 4:54 seconds to complete on our zero-point system. Although *CS2* is slightly better at multithreading than the previous versions of *Photoshop*, this test primarily uses a single CPU core. It favors faster CPUs and more RAM, but chipset and hard drive performance also affect the score.

Ahead Nero Recode 2.0

Our old VOB-to-Divx test was good in its day, but in the last year, DVD-ripping tools have improved greatly. To modernize our video-encode benchmark, we selected Ahead's *Nero 7 Recode 2* application to encode a DVD movie to a format that's playable on a Sony PSP.

To remove the optical drive's ripping speed from the equation, we copy about 7GB of VOB files to the local drive before tasking *Recode* with transcoding it to a PSP-friendly MPEG-4 file. *Recode 2.0* is multithreaded and favors dual-core processors and AMD. On our zero-point, it took roughly 35 minutes to encode our file using a single-pass. A 3.46GHz Pentium Extreme Edition 955 took about 19 percent longer.

Quake 4

For graphics- and game-performance tests, we use a DirectX-based game and an OpenGL game. For this benchmark rev, we're upgrading from *Doom 3* to *Quake 4* (which uses a modified *Doom 3* engine). Besides besting the former title with flashlight-on gun technology, *Quake 4's* 1.11 beta version runs more than one thread, whether you've got a dual-core or Hyper-Threaded CPU, or multiple processors. We run *Quake 4* at 1600x1200 resolution with 4x antialiasing and 4x anisotropic filtering. Above 4x AA, we noticed inconsistencies in performance and image quality among different vendors' GPUs. To keep things fair, we side-step the issue by sticking with 4x AA.

We initially had qualms about adopting *Quake 4* as a benchmark because Raven called the patch that enabled multithreading the "Intel patch." The subsequent 1.1 beta and 1.1 final patches carry

Continued on page 66→

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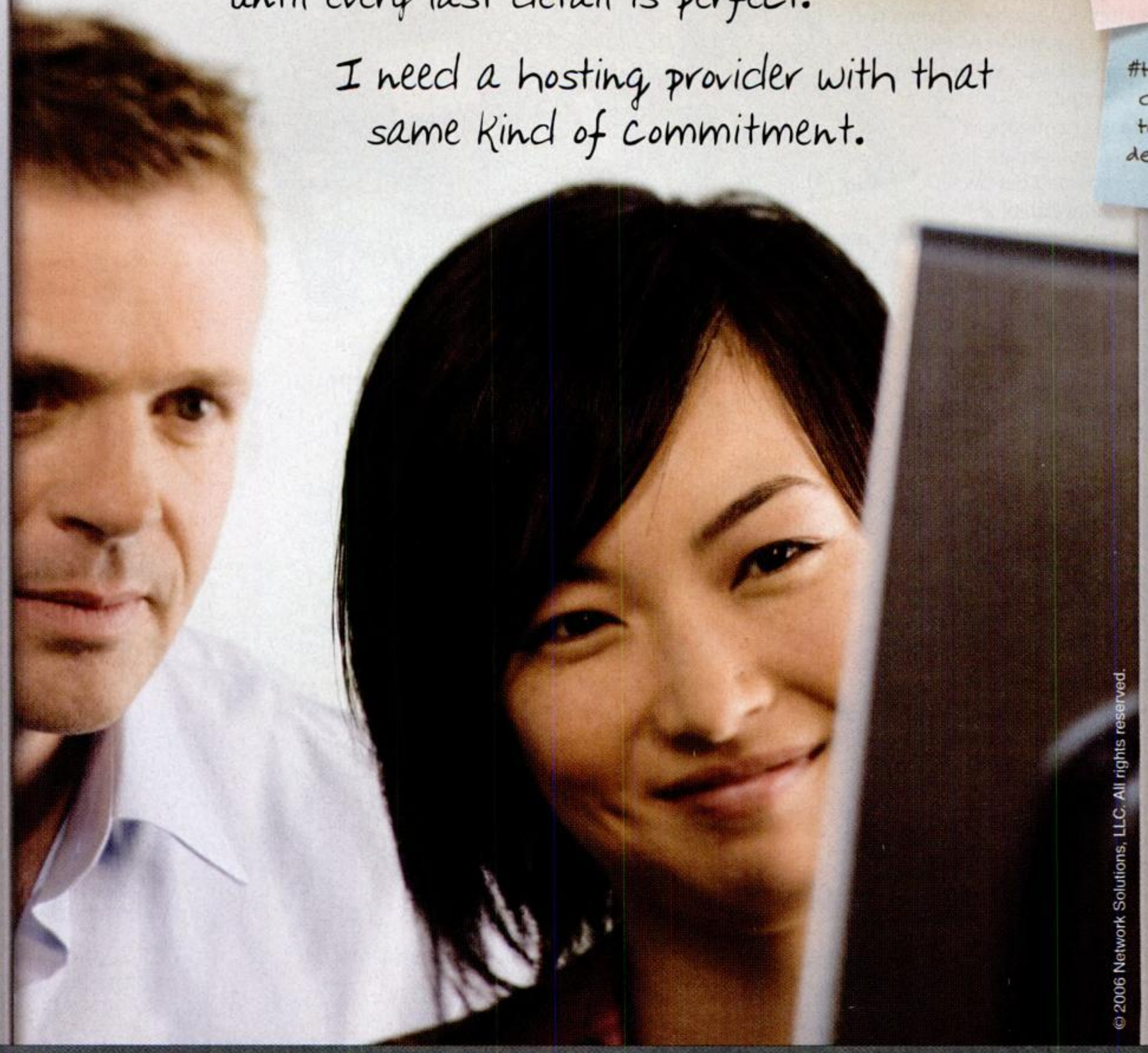
I need a hosting provider with that same kind of commitment.



Windows or Unix, we have everything you need to build and host a successful Web site, including database access and lots of storage, data transfer and e-mailboxes. Backed by a 30-day limited money back guarantee and toll free, 24/7, Real-Person Customer Service™ consultants. Call or visit us to learn more, and to find out all the ways we can help take your business farther.

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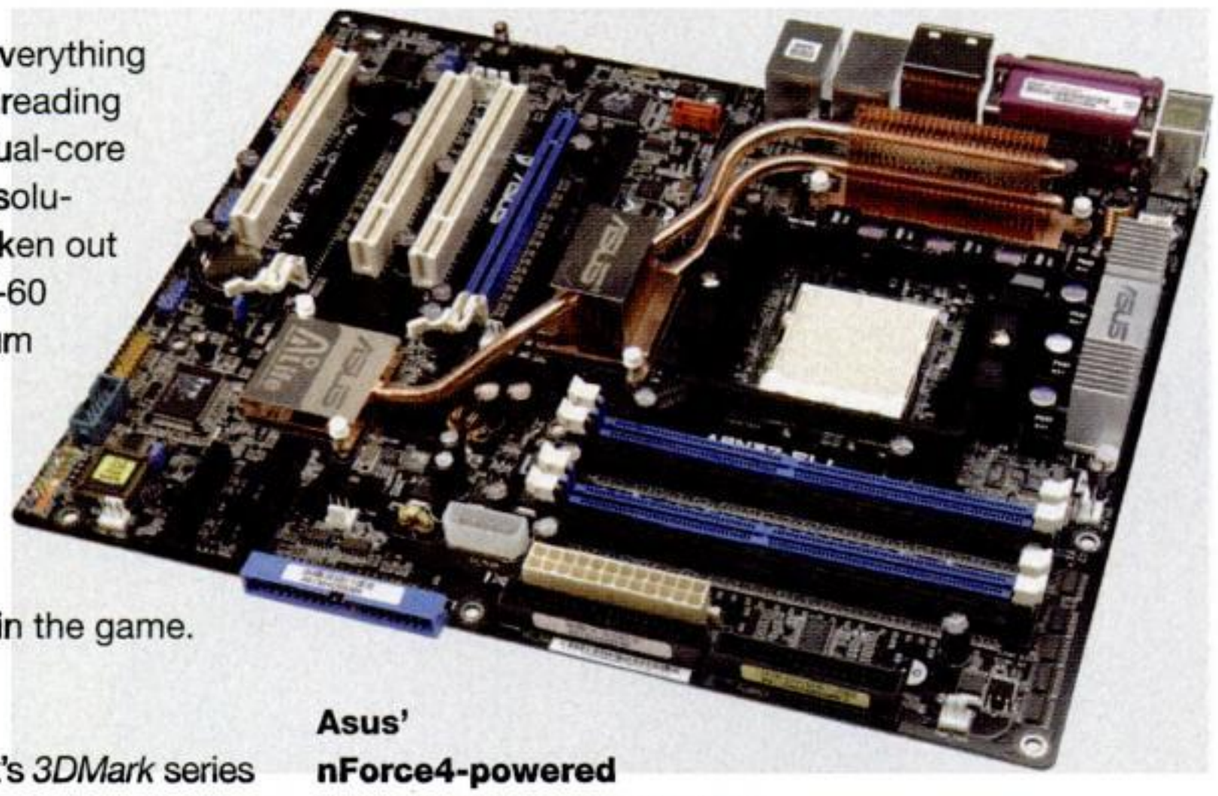
Continued from page 64

no Intel branding. To make sure everything was kosher, we tested the multithreading support on both Intel and AMD dual-core processors. The result? At low resolutions, when the videocards are taken out of the equation, the Athlon 64 FX-60 was faster than a 3.46GHz Pentium Extreme Edition 955.

Because the game doesn't feature a stock benchmark like *Doom 3,* we recorded our own custom demo that combines both interior and exterior scenes in the game.



Asus' nForce4-powered A8N32-SLI boards are the foundation upon which we've built our new test rigs.

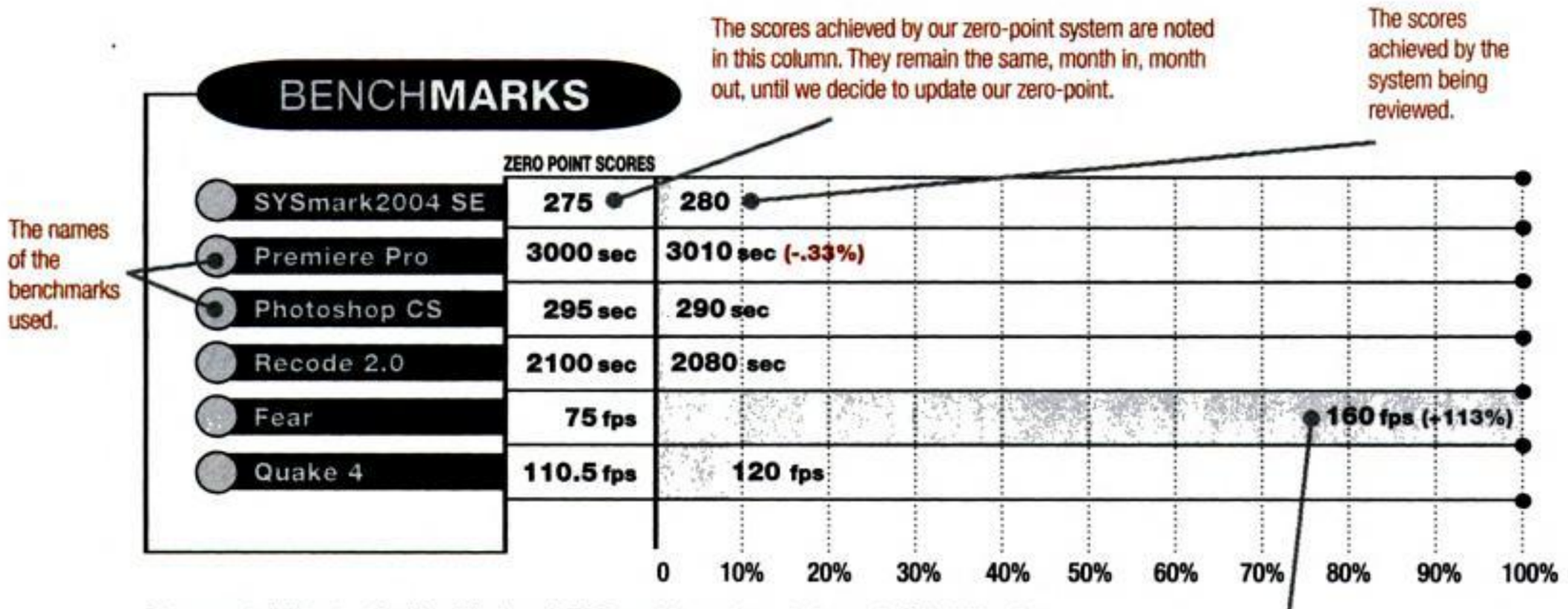
FEAR

Previously, we've used FutureMark's *3DMark* series to benchmark Direct3D gaming performance. It was our only option during a drought of benchmarkable DirectX games that actually used advanced GPU features. But *FEAR's* integrated benchmark fits our bill perfectly. *FEAR* uses advanced graphics features, such as soft shadows, in its rendering engine. There's one catch, however: A bug in the game prevents you from turning on soft shadows and antialiasing at the same time. We opted for soft shadows, which our testing shows is a more stressful task for graphics cards. We run the test at 1600x1200 with physics and hardware audio acceleration enabled, if available. The game is a test of both the graphics card and the system's CPU, RAM, and chipset performance. MPC

We're running 2GB of Corsair DDR400 in our new test beds. With games like *Battlefield 2* and *Oblivion* sucking up memory, 1GB doesn't cut it.

How to Read Our Benchmark Chart

Maximum PC's test beds double as zero-point systems, against which all review systems are compared. Here's how to read our benchmark chart.



BEST OF THE BEST

Our monthly category-by-category list of our favorite products. New products are in red.

High-end videocard:
XFX GeForce 7900 GTX (model PV-T71F-YDD9)
Boasts core and memory clocks of 700- and 900MHz, respectively, versus the reference design's 650- and 800MHz clocks.

Midrange videocard:
eVGA e-GeForce 7900 GT CO Superclocked
Nearly as fast as a Radeon X1900 XT, for $200 less

Soundcard:
Creative Labs X-Fi Xtreme Music

Hard drive:
Western Digital WD5000KD
Add 100GB to our favorite WD4000KD and you get a new king of the hill

External backup drive:
Western Digital Dual-Option Media Center 320GB

Portable USB drive:
Seagate Portable External Hard Drive 100GB

DVD burner:
Plextor PX-716A

Widescreen LCD monitor:
Dell 2405FPW

Desktop LCD monitor:
NEC 90GX2
A unique glossy screen makes this monitor's picture sparkle

Socket 939 Athlon 64 mobo:
MSI K8N Diamond Plus

Socket 775 Pentium 4 mobo:
We're recommending that readers hold off on P4 board purchases until official Conroe support is available

Portable MP3 player:
Apple iPod

5.1 speakers:
M-Audio Studiophile LX4 5.1 (LX4 2.1 with 5.1 Expander System)

2.1 speakers:
M-Audio Studiophile LX4 2.1

Mid-tower case:
Lian Li PCV-1100

Full-tower case:
Silverstone TJ07

Games we are playing: Elder Scrolls IV: Oblivion, Condemned: Criminal Origins, Battle for Middle Earth: II, Galactic Civiliations II: Dread Lords, Battlefield 2

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2

Slim Cable FLEXFORCE®

What is FlexForce?

Manageable
FlexForce Cables are designed to be easily routed and hidden within your case.

Increased Airflow
Special design allows air to travel 30% more effective then standard cables, increasing efficiency.

Design
Cables are dressed in a sleek looking titanium like finish.

DR DUAL RAIL TECHNOLOGY

What is Dual Rail Technology?

Better Power Distribution
The X-Connect distributes 12V power to the components that require it the most in modern PC's.

Dedicated CPU Rail -
Dedicated 12V Rail for the 2x2 Motherboard Connector

More stable power when you need it...

ALUMINUS

GAMING CASES

Ultra Aluminus Aluminum Case

This all new Ultra Aluminus lightweight aluminum case is in a class by itself when it comes to dazzling looks and phenomenal performance for a wide range of systems. Yes, this Ultra Aluminus case is 100-percent pure eye-candy. As its name implies, the Ultra Aluminus has been crafted using the finest, most durable lightweight aluminum on the market. And it includes a large innovative clear side panel.

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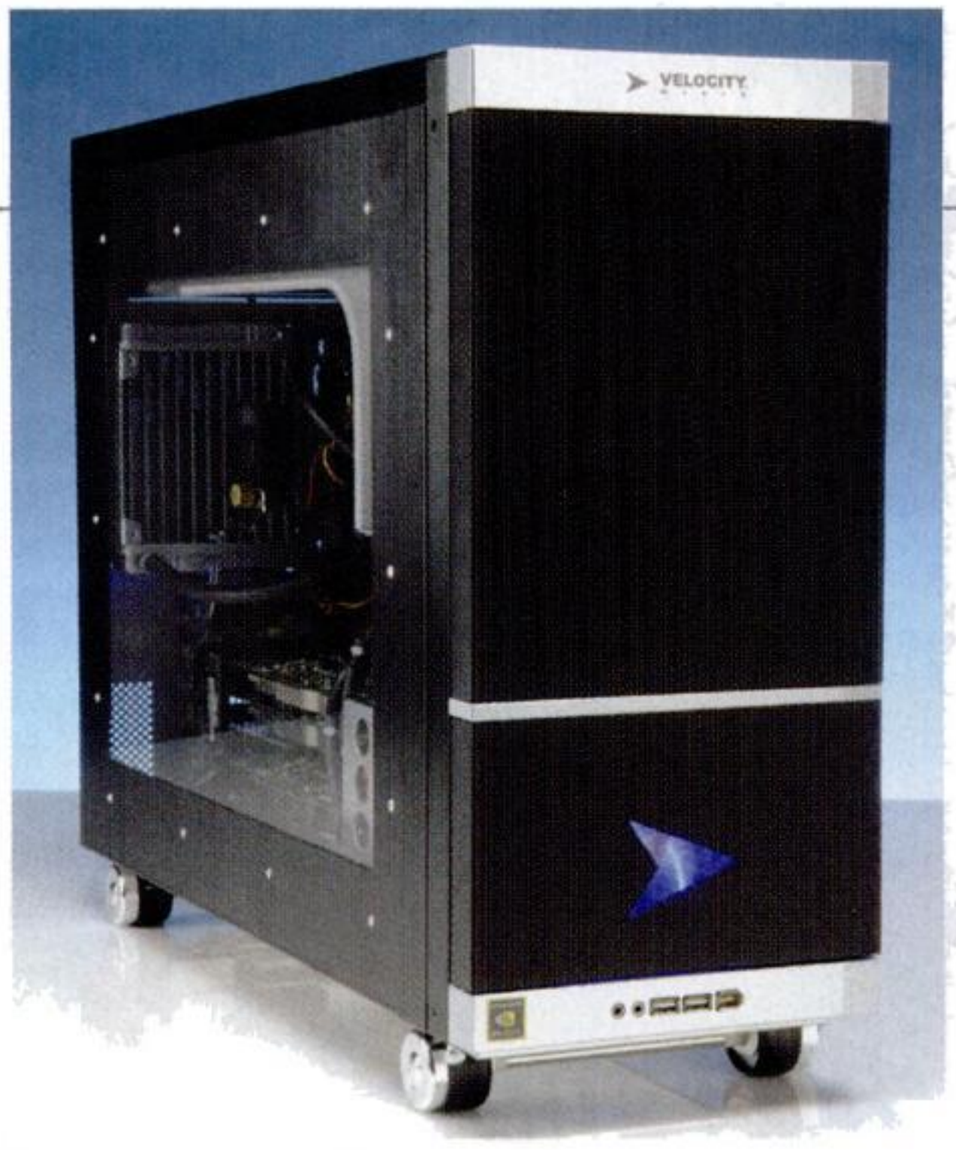
Velocity Micro Gamer's Edge DualX

Fast, but too loud for our taste



The Gamer's Edge DualX is a no-nonsense SLI-powered gaming machine that makes mincemeat of our benchmarks.

You were supposed to be staring at a production PC sporting nVidia's quad-SLI this month, but you're not.

Truth be told, we actually had a Velocity Micro with quad SLI up and running in glorious ultra high-resolution until a last-minute critical bug caused nVidia to delay the launch of quad SLI just long enough to make our review of the machine impossible in this issue. Drat.

Fortunately, Velocity Micro did a quick one-two and replaced the quad setup with the next-best thing: a pair o' eVGA GeForce 7900 GTX cards running in standard SLI mode. While we're withholding judgment on quad SLI until we can formally review it, we will say that a dual-SLI config probably makes more sense for the majority of gamers who play at a 1600x1200 or lower resolution.

Dropping down to two cards by no means renders the Gamer's Edge DualX chopped liver. And next to the Voodoo PC we reviewed last month, it's almost affordable. The pair of GeForce 7900 GTX cards are coupled with an Athlon 64 FX-60 overclocked from the stock 2.6GHz to 2.9GHz. Also aboard are 2GB of Corsair DDR400, a pair of Lite-On dual-layer DVD burners, two Western Digital 150GB Raptor drives, and a 400-gigger drive for back-ups. Velocity Micro doesn't pull punches in the power supply category either, shoehorning a PC Power and Cooling 1-kilowatt beast into the rig. That's enough power to run a small home. Nestled between the two burly 7900 GTX cards is a Creative Lab's X-Fi soundcard.

We're especially jazzed about Velocity's snazzy implementation of the X-Fi card. Many cases feature headphone and mic jacks in front, which unfortunately don't work with the X-Fi. Velocity Micro gets around this with a custom harness that's so cool it should be sold independently.

In the cooling department, Velocity Micro uses a Cooler Master AquaGate Mini R120 to keep the OC'd FX-60 from melting down. The company is also mindful of the potential overheating issues on motherboards that use passive heat, so it mounted a Zalman fan over the chipset heat pipe. While it's a good idea, the fan and bracket look a little slap-dash to us.

We dig Velocity Micro's custom Lian Li case, which is easy on the eyes and provides plenty of space. But we don't dig the system's noise factor. For a water-cooled PC, the Gamer's Edge DualX is awfully loud. Sure, the chassis was originally configured for quad SLI, but someone's going to have to come up with a quieter solution; the noise is unacceptable.

We were curious to see how the DualX would perform against our new zero-point,

The 1-kilowatt power supply can probably run this rig, and the two machines next to you at a LAN party.

running our new benchmarks—after all the two rigs are kissin' cousins in configuration. Of course, our zero-point rig lacks 10K RAIDed Raptors, an overclocked processor, and overclocked videocards—so maybe they're more like hand-shakin' cousins. Unfortunately, we ran into a snafu with our *SYSmark2004 SE* run. Amid the transition to our new benchmarks, we initially installed and tried to run *SYSmark2004* on the Gamer's Edge DualX; and once you've installed any previous version of *SYSmark*, you can no longer run newer versions, so *SE* was out of the question.

UNDER THE HOOD

BRAINS

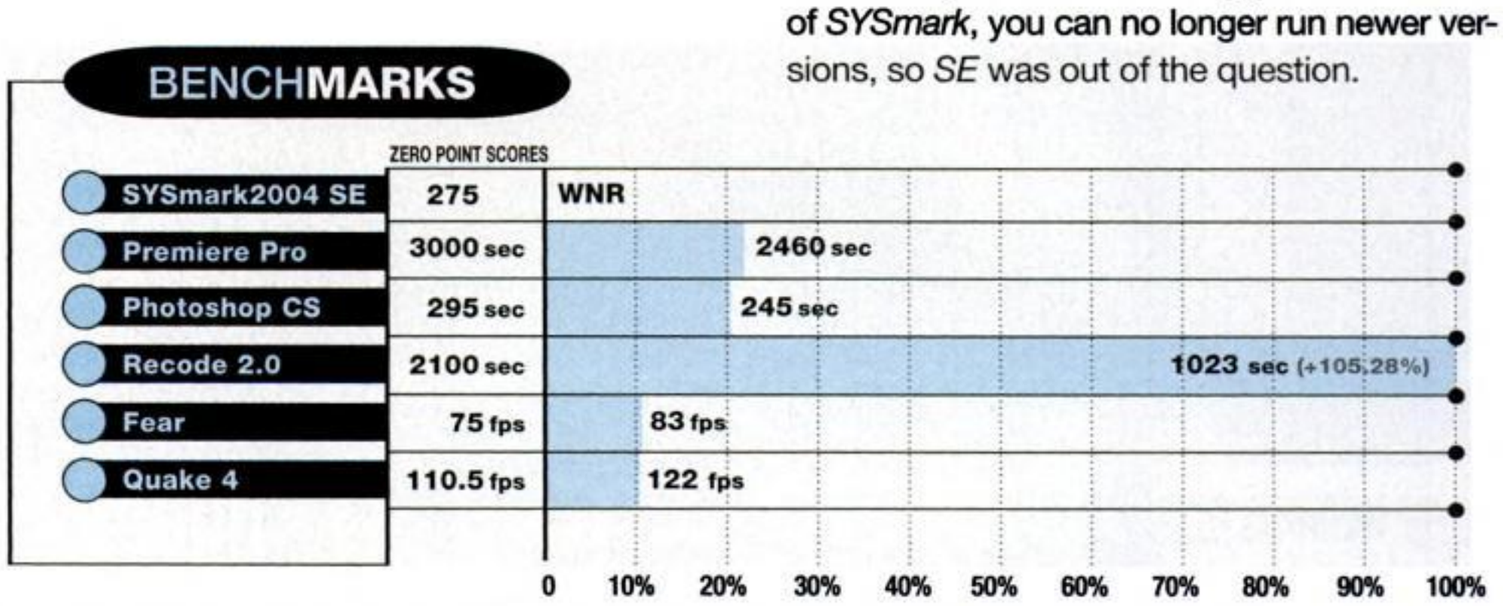
CPU	AMD Athlon 64 FX-60 (2.6GHz dual core)
MOBO	Asus A8N32-SLI (nForce4 x16)
RAM	2GB Corsair (two 1GB sticks)
LAN	Dual Gigabit LAN
HARD DRIVE	Two 150GB Raptors (10,000rpm SATA) in RAID 0 and 400GB WD4000KD
OPTICAL	Lite-On SHW-160P65

BEAUTY

VIDEOCARD	Two eVGA GeForce 7900 GTX 512MB in SLI (695MHz core, 825MHz RAM)
SOUNDCARD	Sound Blaster X-Fi Xtreme Music
CASE	Velocity Micro signature case

BOOT: 46 sec. DOWN: 14 sec.

BENCHMARKS



Our current desktop test bed is a Windows XP SP2 machine, using a dual-core 2.6GHz Athlon 64 FX-60, 2GB of Corsair DDR400 RAM on an Asus A8N32-SLI motherboard, two GeForce 7900 GTX videocards in SLI mode, a Western Digital 4000KD hard drive, a Sound Blaster X-Fi soundcard, and a PC Power and Cooling Turbo Cool 850 PSU.

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Our other benchmarks ran fine, however. In our *Premiere Pro 2.0* benchmark, where we make a small movie starting with HD video and outputting it to *WMV9* at 720p, we finally saw a difference between the FX-60 and Intel's Pentium Extreme Edition 955. Previously, the 955 system delivered almost exactly the same time as our Athlon 64 FX-60. The overclocked DualX changed that. Even though the Gamer's Edge has only a 12 percent clock bump over our stock FX-60, it finished our Premiere Pro 2.0 test about 22 percent faster. The machine was also an impressive 20 percent faster than our zero-point in the *Photoshop CS2* script.

The most unusual score came in our new *Nero Recode 2* test, where we encode VOB files from a DVD to an MPEG-4 format to play on a Sony PSP. We saw the DualX finish the test in an astounding 17 minutes (about 100 percent faster than our test rig). That doesn't jibe with our tests during the benchmark build-out process, so we've contacted the developer to root out any possible bugs. In our two gaming benchmarks, the DualX's overclocked CPU and videocards helped the rig achieve scores about 10 percent faster than our zero-point in both *FEAR* and *Quake 4*.

The DualX's performance deserves applause, but its noise level doesn't. We also have to ding the machine for its untidiness. While we don't expect every system's wiring to look Voodoo-clean, the DualX's interior could be tighter. Still, these aren't horrible faults, and when it comes to the benchmark numbers, this rig delivers.

—GORDON MAH UNG

VELOCITY MICRO GAMER'S EDGE DUALX

MICHAEL KEATON

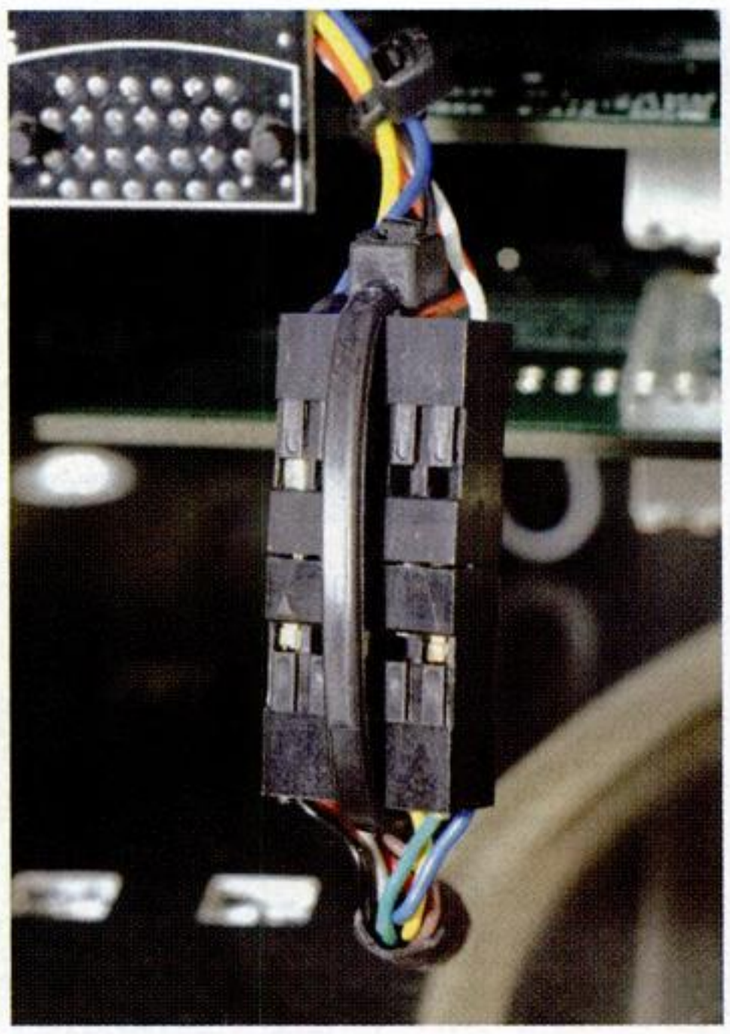
Full-tilt SLI for almost two grand less than the competition.

MICHAEL CRICHTON

A Hoover-vacuum impression mars an otherwise nice PC.

8

$5,600, www.velocitymicro.com



We love the DualX's custom audio harness, which lets the front audio jacks on the case talk to the X-Fi card.

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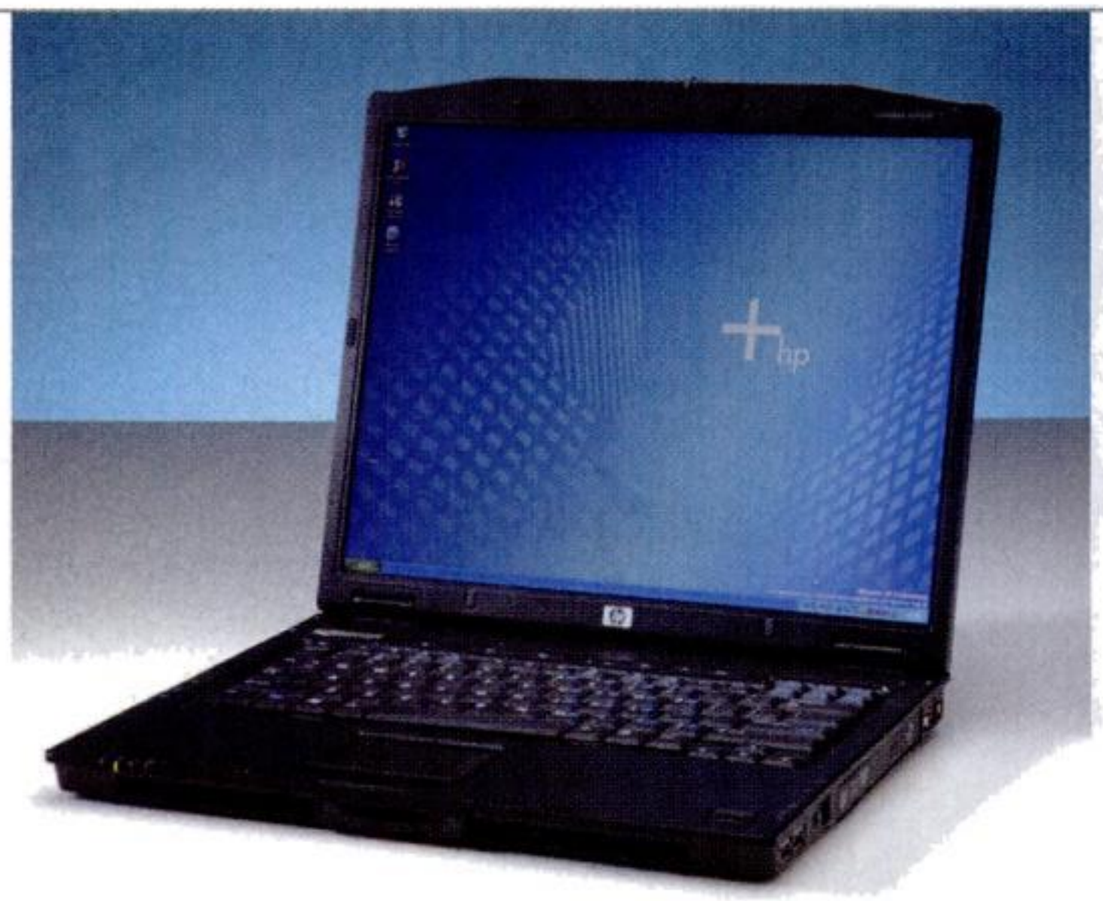
HP nc6320

Damn near perfect for everything except games



HP's nc6320 notebook is the first laptop we've seen with Verizon's EVDO wireless broadband. We could connect to it anywhere in San Francisco.

Hewlett-Packard certainly isn't known for making high-end gaming notebooks, but the company does know its way around corporate configs. This nc6320 has everything we love in a notebook—including Intel's popular Core Duo dual-core mobile CPU—but uses a technology so outdated we dare not speak its name. OK, we'll say it: *onboard video*—a parts choice that makes 3D gaming literally impossible. To compensate for this slap in the face to common decency, the rig comes loaded with Verizon's high-speed EVDO wireless broadband connectivity. The technology works too, making this an ultra-powerful, highly portable notebook.

HP crafted the laptop to withstand the hazards of the open road. Its shell is made of magnesium-alloy to withstand any bumps and bruises it might encounter, and a layer of Mylar below the keyboard protects the notebook's vitals from becoming scrambled by spilled coffee or some other errant beverage. There are even little rubber bumpers surrounding the keyboard to keep the 15-inch LCD screen from touching the keys when you shut the lid. We don't see this feature enough on laptops—it's definitely welcome.

The embedded EVDO wireless broadband is easily the most notable—and coolest—feature of the nc6320. It works through Verizon's network, and made it a breeze to log onto the web from anywhere in San Francisco. (Verizon claims the service is available in every large metropolitan area in the U.S., but make sure your city is covered before taking the plunge). Users connect to the Internet by simply opening up the Wireless Connections window, selecting the Verizon network, and logging on. Is it a fast connection? Heck yeah. We consistently experienced a strong signal and fast downloads. In fact, for simple web browsing, the connection felt just as fast as the cable modem we use at home, although our actual throughput for large downloads was around 40KB/s. The EVDO service costs $60 a month, but if you don't want to pony up the cash there's the option of using Wi-Fi or Bluetooth technology, both of which are integrated.

For paranoid types, there's a built-in biometric fingerprint scanner. It's purely optional, and is tied to the Trusted Platform Module (TPM) on the Intel chipset. Using these two systems in tandem, your fingerprint basically acts as the key to your computer. A registered fingerprint gains entrance, while intruders are denied.

The notebook's 15-inch screen is small, but impressive. Images are bright and sharp at the 1400x1050 native resolution. But as we mentioned before, the integrated Intel graphics are strictly 2D. As for battery life, we got three and a half hours of continuous use surfing the web, but only 90 minutes while playing games (of course, with the onboard graphics, you won't be doing much of that). The included speakers are simply sufficient.

The nc6320 isn't perfect, but it comes close—for non-gamers. It's plenty powerful and the wireless options are impressive. We also love its lithe six-pound carry weight, the security features, and its durable chassis. Sure, it would be nice to have the option to fire up a game now and then, but this is nonetheless a capable and useful machine that has "road warrior" written all over it.

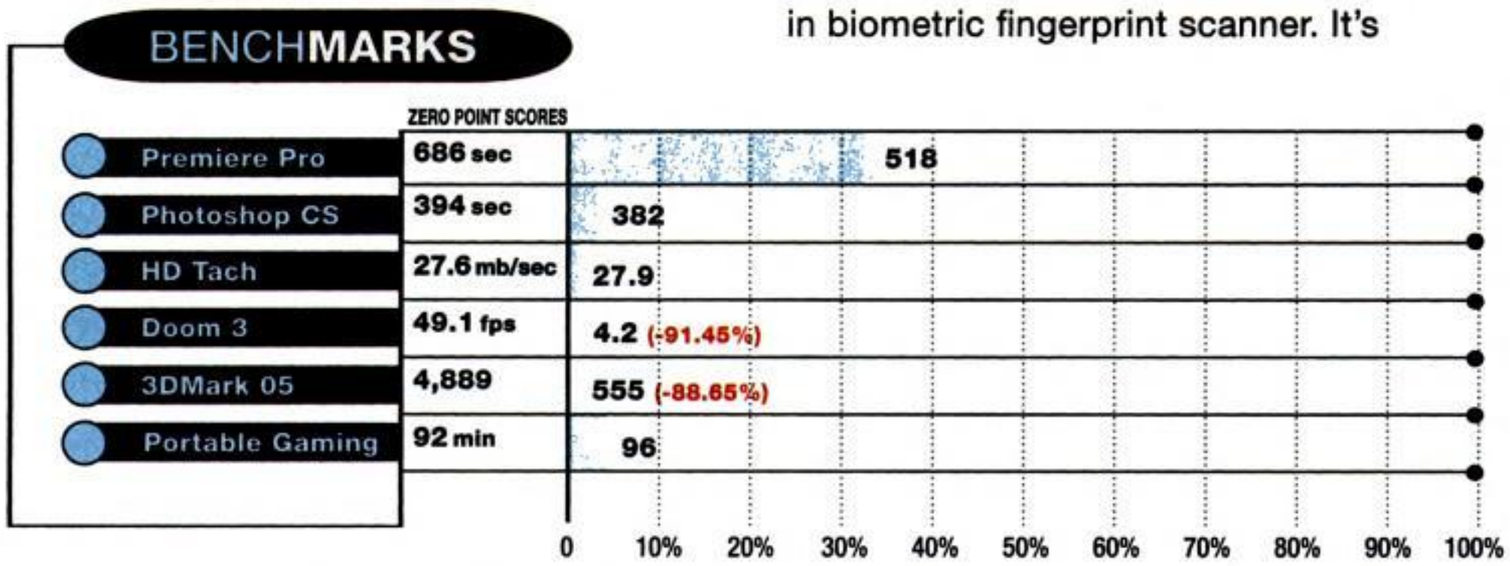
—MICHELE FOLEY

UNDER THE HOOD

BRAINS	
CPU	2GHz Intel Core Duo T2500
RAM	1GB DDR667
LAN	Broadcom Gigabit, EVDO, 802.11a/b/g, Bluetooth, modem
HARD DRIVE	Toshiba 80GB, 5,400rpm, SATA
OPTICAL	TSST TS-L532 M

BEAUTY	
VIDEO	Intel Graphics Media Accelerator 950 (128MB shared system memory)
DISPLAY	15-inch (1400x1050@32-bit)
AUDIO CHIP	16-bit Sound Blaster integrated
LAP WEIGHT	6 lbs, 1 oz
CARRY WEIGHT	6 lbs, 14 oz
BOOT: 44 sec.	DOWN: 40 sec.

BENCHMARKS



Our zero point is a Dell Inspiron XPS, with a 2.13GHz Pentium M, 1GB of DDR2/533 RAM, and a GeForce Go 6800 Ultra.

HP NC6320

LAPTOP

Lots of wireless options, durable design, and hefty security.

RUNNING LAPS

So-so speakers; it can't do gaming; 5,400rpm drive.

8

$1,800, www.hp.com

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COMPLETE THERMALTAKE
COMPUTER MODS,
EXCLUSIVELY AT RADIOSHACK.

Here's how to shake up your next LAN party or computer competition.
New Thermaltake Computer Modding Components, coming soon to RadioShack.
A collection of cool lights, cables, fans and more that let you totally trick out your CPU.

So don't settle for the same old boring box.
Bust out with some serious PC bling from Thermaltake, at RadioShack.

RadioShack will be the exclusive retailer of the complete line of Thermaltake Computer Modding Products. Go online to RadioShack.com and see the complete line of Thermaltake, or to find a participating RadioShack store near you.

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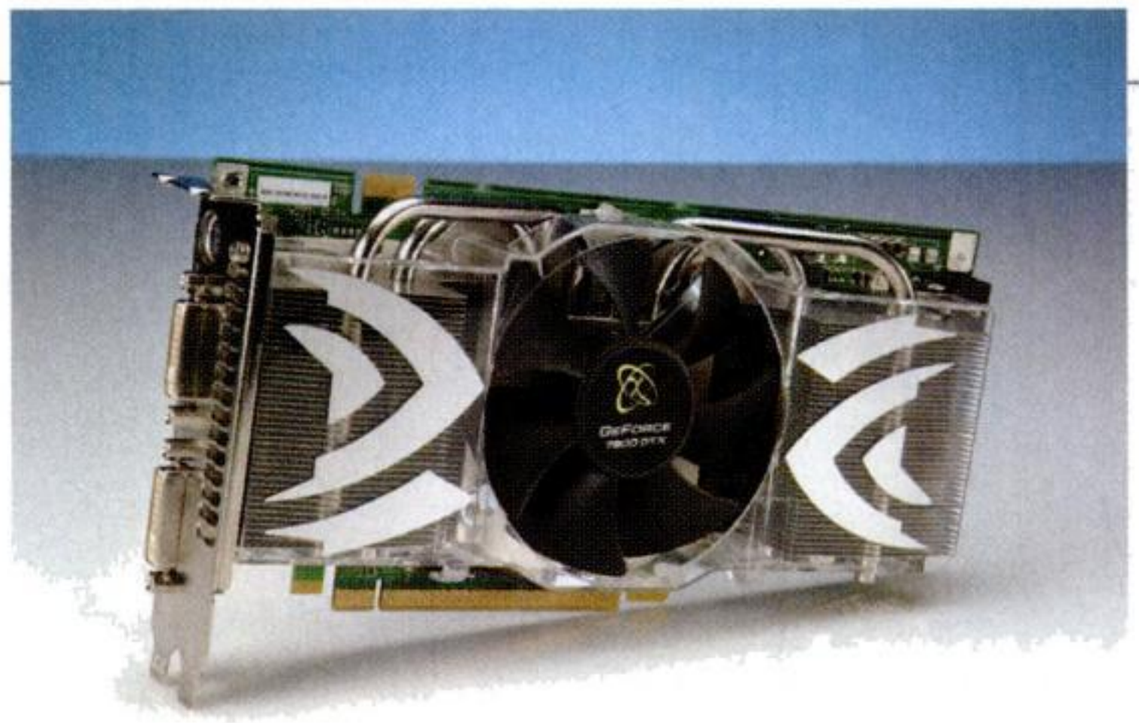
High-End Hijinks

Speedy videocards—and lofty price tags—from Sapphire and XFX

We examined reference-design cards featuring ATI and nVidia's high-end GPUs in our April and May issues, respectively. And we bestowed Kick Ass awards on both. Now we're dropping third-party versions of those cards into our new FX-60, dual-x16 PCI Express test beds to see if we can declare a more clear-cut winner.

—MICHAEL BROWN



XFX has five different versions of nVidia's GeForce 7900 GTX; make sure you know what you're bringing home.

SAPPHIRE RADEON X1900 XTX

Our previous-generation test beds were based on nVidia's nForce4 chipset, because we needed to test SLI configurations. It could be argued that this situation gave nVidia an edge—it was always an away game for ATI—but it didn't stop the Canadians from pulling out a few wins. But now that ATI has its own dual-card solution in CrossFire, we'll test all ATI-powered videocards in Asus' A8R32-MVP Deluxe motherboard, which is powered by ATI's own CrossFire Xpress 3200 chipset.

Sapphire's Radeon X1900 XTX delivers brilliant video and graphics, but you needn't spend $500 to enjoy ATI's Avivo technology.

So how does Sapphire's Radeon X1900 XTX stack up? The answer depends on which of a videocard's several missions you value the most. We've praised ATI's Avivo technology before, and we'll do it again: Video looks fantastic on Sapphire's X1900 XTX—much better than it does on XFX's GeForce 7900 GTX. Avivo renders games more attractive, too: Colors are brighter, richer, more saturated.

But we cannot live on color alone, and that's Sapphire's biggest problem: Its X1900 XTX gets clobbered by XFX's entry in almost every gaming benchmark, with one exception: in CrossFire mode, Sapphire's card delivered a *Quake 4* Ultra Quality score 15 percent faster than XFX's. An impressive margin to be sure, but it's only one benchmark. Because ATI won't allow third parties to overclock its cards, the ultimate performance of the Sapphire card is going to be exactly the same as the stock ATI card.

SAPPHIRE RADEON X1900 XTX

+ '80s MUSIC

Rich, vibrant video and graphics. Fab *Quake 4* performance in CrossFire mode.

– '80s HAIR

Gets beat up in nearly every other benchmark. Noisy cooling fan.

8

$500, www.sapphiretech.com

XFX GEFORCE 7900 GTX

We tapped another Asus motherboard for our new nForce4-powered test bed: the A8N32-SLI Deluxe. But let's pick up our coverage of XFX's side of the fight where we left off with Sapphire's: In a surprising turn of events, nVidia's terrible twins got their asses handed to them when we pitted SLI against CrossFire in *Quake 4* at Ultra Quality. If that's the only game you ever intend to play, and you've got the bucks for a pair of Sapphire's best, go for it. But wouldn't that be akin to attending a lavish banquet and limiting yourself to the Beef Wellington?

As the tale of the tape tells, you'd be missing plenty: We tested XFX's overclocked GeForce 7900 GTX implementation (model PV-T71F-YDD9), which has a 700MHz core and 512MB of memory blazing along at 900MHz. This monster rolled over and flattened its X1900 XTX-powered competitor in both single- and dual-GPU modes. In single-card mode, XFX beat Sapphire by 18 percent playing *FEAR*, by 9 percent in *Call of Duty 2*, and by 14 percent in *Quake* at High Quality (it was a tie at Ultra Quality).

True, ATI's chip delivers prettier graphics and video, but you must disable CrossFire to watch a movie. SLI has no such limitation; besides, our tests revealed SLI to be generally faster—by wide margins: a 26 percent edge in *FEAR*, 24 percent faster in *Call of Duty 2*, and 10 percent quicker in *Quake 4* at High Quality.

If you really don't care about games, ATI has the better solution. But non-gamers don't need to spring for the top-drawer GPU to get Avivo functionality—any card in the X1000 line will likely suit your needs.

XFX GEFORCE 7900 GTX

+ GREGORIAN CHANT

Rules the benchmark charts; relatively quiet, even when running in SLI.

– GREGORIAN CALENDAR

Expensive; looks drab next to Avivo; loses to CrossFire in *Quake 4*/Ultra Quality.

9

MAXIMUM PC KICKASS

$590, www.xfxforce.com

BENCHMARKS

	SAPPHIRE X1900 XTX	XFX 7900 GTX	SAPPHIRE CROSSFIRE	XFX SLI
QUAKE 4 HIGH / ULTRA	63.0/51.8	**73.2**/51.8	102.4/**88.5**	**113.2**/77.1
CALL OF DUTY 2	49.5	**54.2**	67.1	**88**
FEAR	40.0	**49.0**	59.0	**80**
3DMARK HDR/SM3 NO. 1	**19.5**	16.7	**35.3**	30.4
3DMARK HDR/SM3 NO. 2	21.4	**23.3**	38.9	**42.2**

All scores expressed in frames per second; best scores are bolded. Visit www.maximumpc.com/benchmarks for additional details.

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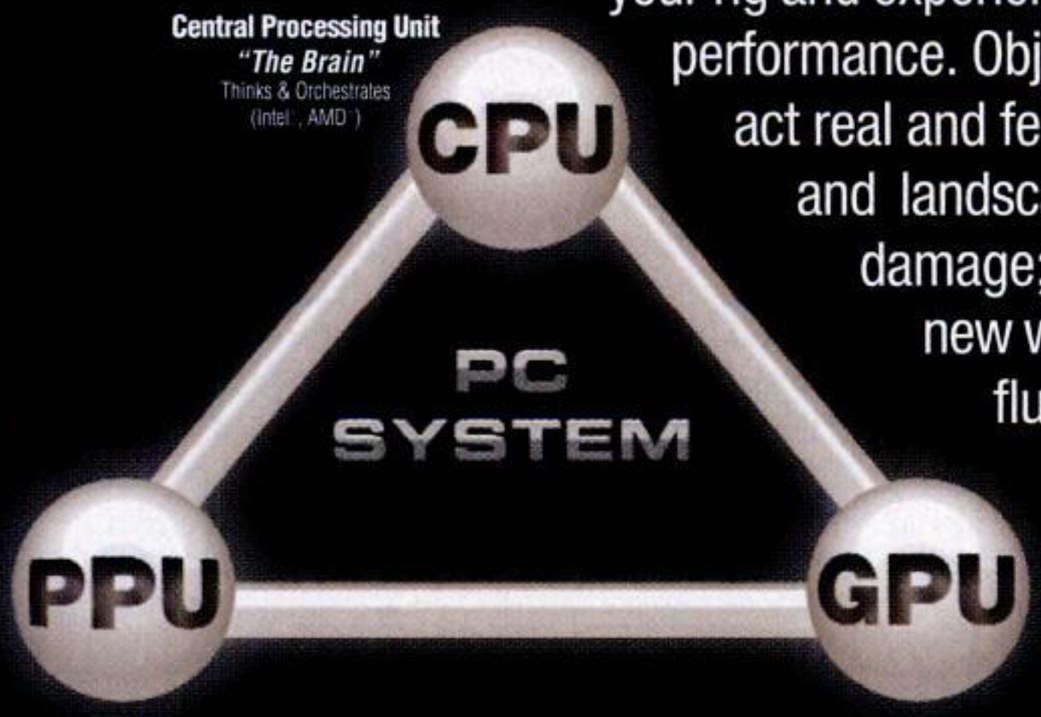

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LCD Monitor Mixer

Four new 19-inch panels vie for your attention

It's gotta be hard for an LCD monitor these days. For one thing, the current market is packed tighter than a Hooter's at happy hour, and thanks to the technology's giant strides, it's harder than ever these days for an LCD to stand out in a crowd. Not only has every Tom, Dick, and Harry joined the fray, but most boast LCDs of competitive quality.

This month we look at four new high-performance LCDs from leading vendors. All offer a 19-inch viewable screen, a 1280x1024 native resolution, and a pixel response time in the single digits. But distinct personalities arise despite seemingly similar specs.

—KATHERINE STEVENSON

SAMSUNG 970P

Call the 970P "Mac Daddy," because its shiny and sleek white cabinet with brushed-metal trim is way reminiscent of Apple's products. A double-hinged neck allows you to raise and lower the screen's height, but we found that the neck wouldn't remain fully upright, inevitably folding under the weight of the screen. Still, there's approximately 4.5-inches of height travel. You can tilt and rotate the screen, and the neck swivels 90 degrees to either side. The 970P also sports a unique cabling system: A connector dongle, with ports for a single DVI cable and a bundled power brick, is separated from the monitor by a 9-inch cable, meant to keep all unsightly wires off your work surface and out of sight. We'd prefer a longer cable between the monitor and the dongle and an integrated power brick—the way Apple builds its displays.

Continuing with the clean aesthetic, the monitor bezel is totally austere—Samsung relocated the power button to the monitor's base, and replaced the standard onscreen display buttons with a software controller called *Magic Tune,* which offers the usual assortment of picture adjustments, as well as a calibration routine, presets for certain types of applications, and custom-profile capabilities. While the software is useful, we'd like to be able to change the brightness or switch presets without having to launch an application.

In the *DisplayMate* (**www.displaymate.com**) evaluation scripts, the 970P stood out as offering the best screen uniformity of the LCDs here, betraying nary a hint of backlight on a completely dark screen. It also proved to have the deepest black level and superb off-axis viewing. In real-world use the 970P's performance was equally strong. Be it web surfing, movies, or games, the colors appeared true and screen quality was consistent.

DELL 1907FP

Dell's 1907FP sports a streamlined black and silver aesthetic. The super-slim neck sports a nifty built-in track that lets you adjust the screen's height with ease, by as much as six inches. A Lazy-Susan-esque base offers 45 degrees of rotation to the left and right. The onscreen display is familiar, offering brightness adjustment and separate Red, Green, Blue color sliders when using a DVI connection. In addition to both DVI and analog inputs, the 1907FP includes four powered USB ports.

The 1907FP delivers solid performance, although it does suffer a couple weaknesses. On a completely dark screen, the backlight was evident along the bottom edge. And in *DisplayMate* we noticed that very light grays were indistinguishable from white on the extreme low end of the grayscale. The latter point could translate to diminished detail in images that contain a lot of light-colored information, but in our evaluations of various digital pictures, video, and games, we didn't notice a detrimental effect. Indeed, the 1907FP was a reliable performer in all of our tests, though we did detect subtle image ghosting in one gaming test, but only where high contrast—a black object against a light sky—exaggerated the effect.

NEC 90GX2

The first thing you notice about NEC's 90GX2 is its glossy screen. It stands in stark contrast to the Samsung and Dell monitors, which are both treated with anti-glare and anti-reflective coatings (as are the majority of LCD screens). These coatings give displays a flat, matte finish that doesn't reflect light. The benefit of NEC's so-called OptiClear technology is that the screen's high sheen intensifies colors and contrast, producing a much more brilliant, vivid picture. Of course, such a screen is not suited to all environments. In our Lab, for instance, the bright overhead fluorescent lights created distracting reflections on the 90GX2's mirror-like surface, and even in lower-light situations, you might notice ambient reflections in large swaths of dark color.

But this isn't likely to dampen most home users' appreciation of the screen's vibrancy. During our testing, the 90GX2 certainly stole the show in the entertainment and desktop applications. Games in particular had extraordinary visual panache, and the screen was free of any signs of ghosting during fast-motion sequences.

Samsung's 970P offers some innovative features, but they could stand to be more fleshed out.

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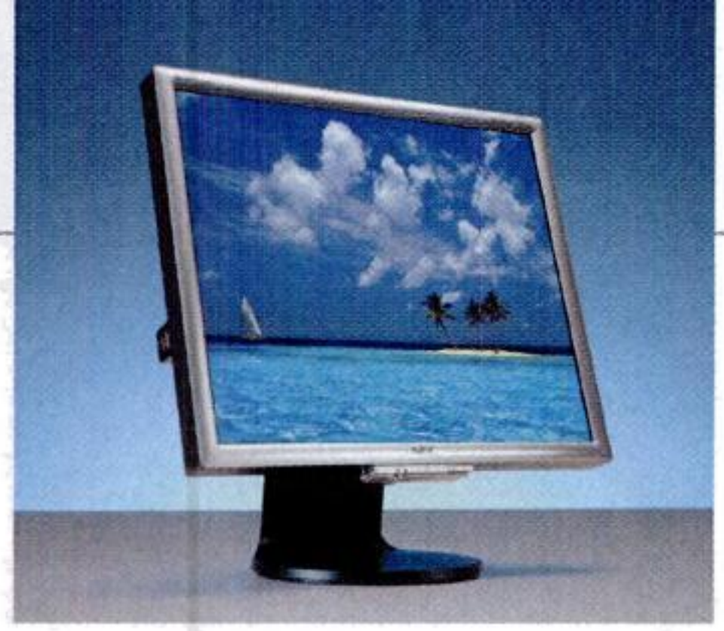

NEC's 90GX2 glossy, vibrant screen is known to stop passers-by in their tracks.

NEC 90GX2

LUSTER

Glossy screen is stunning in the right environment; four USB ports.

BLUSTER

Glossy screen can be a problem in some environments; lacks height adjustment; some grayscale issues.

9

$500, www.necdisplay.com

But the 90GX2 isn't flawless. The backlight is visible around the perimeter, especially on a primarily dark screen. And in *DisplayMate* we observed subtle color-tracking errors in grayscales of 64 steps or more (characterized by varying tints throughout the steps of the scale), and some compression at the dark end of scales comprising 128 or more steps. But these issues are of more concern to a user whose work requires precise color matching. As we said before, in our experience with a broad range of content, the 90GX2's picture is exceptional.

Like Samsung's 970P, the 90GX2 features a number of color-and-brightness presets intended to enhance various types of content—Photo, Movie, Games, etc. Unlike the 970P, however, you can switch among these offerings through the OSD buttons on the monitor's bezel. Sadly, the NEC doesn't have any built-in mechanism for height adjustment or screen rotation, although it does offer four powered USB 2.0 ports (along with analog and DVI inputs), which we like. And neat freaks might dig this display's cable-management system, which lets you run your signal, power, and USB cables discreetly through the monitor's neck (which has a detachable back).

XEROX XG-91D

Xerox's XG-91D screen sports a unique finish that straddles the line between matte and glossy. While the screen appears to be treated with an anti-glare coating, a sheer outer layer, which Xerox dubs XShield Protective glass, makes for a reflective surface—not so reflective as NEC's screen, but also not as eye-popping. In fact, the XG-91D's image appeared somewhat muted alongside the other monitors here. It helped some to turn up the brightness, but that threw the screen's black level out of whack.

Another dubious feature is the monitor's hard-wired DVI cable—the sole input besides power. It might ensure that the cable never gets loose or lost, but it also means that a bent pin on the $5 cable could render your display useless. And we're always a little disappointed when a monitor lacks an ergonomic stand. The XG-91D's screen can't be raised, lowered, or rotated. It tilts forward and back—that's all. Buttons on the bezel offer the standard OSD options.

During testing, the XG-91D delivered respectable performance in *DisplayMate*. The backlight did show through in spots on a solid screen, and the display's white appeared a little dull compared with the other screens here, but neither issue was severe. And to its credit, the XG-91D reproduced smooth, perfectly graduated grayscales of up to 256 steps. The XG-91D also handled all types of real-world content, including several games, without stumbling. Weighing its various qualities, we'd say it's a decent LCD, but for the same money, you can get something much better.

In a crowded field, it takes a special something to attract the attention of discriminating users, and Xerox's XG-91D doesn't have it.

XEROX XG-91D

VIVID

Decent overall performance.

LIVID

Hard-wired DVI cable; lacks ergo stand; muted picture.

7

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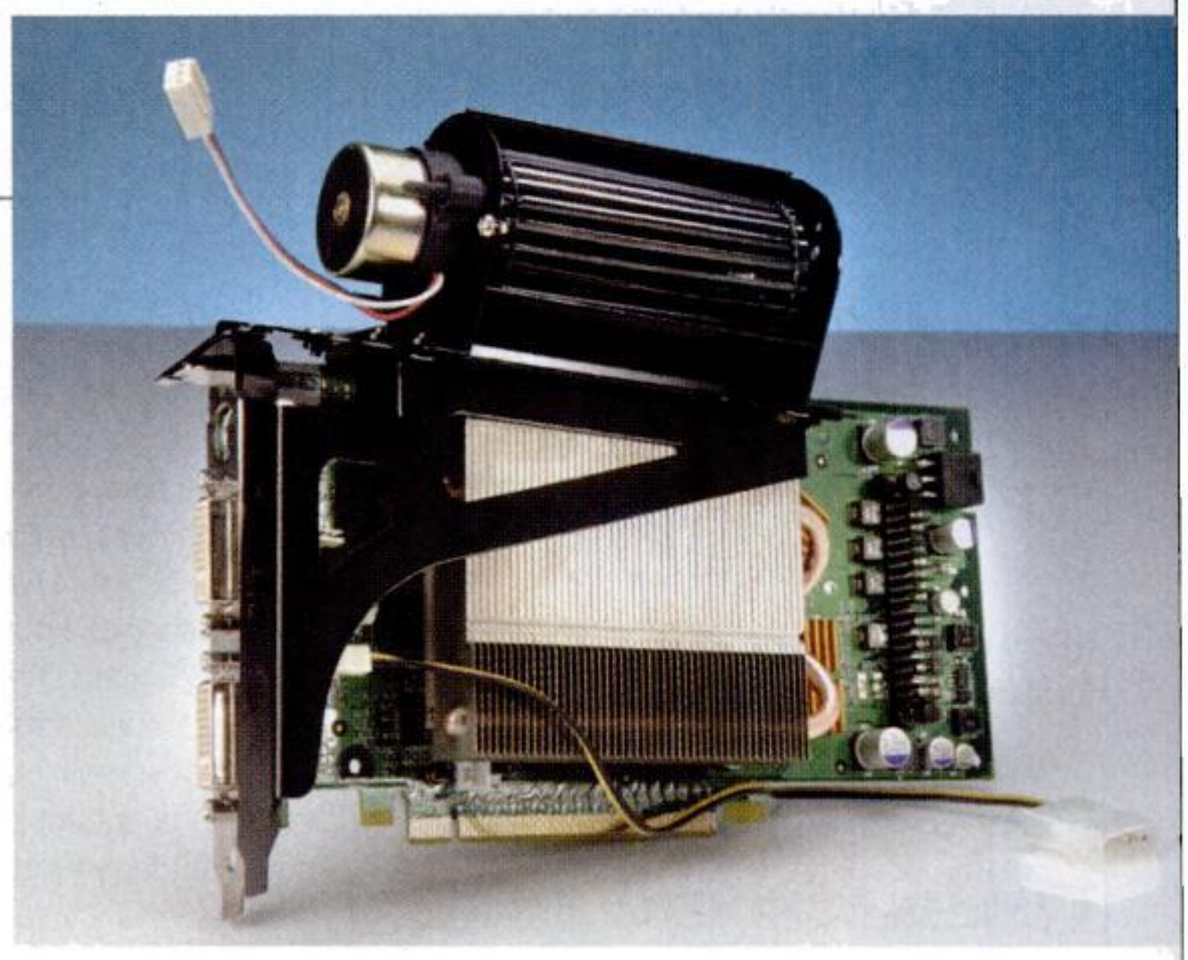
Cooler Catfight

Fur flies when two videocard coolers bump fins in the Lab

Zalman's amazing VF700-Cu ruled the graphics card-cooling roost with a copper fist for nine months, until Arctic Cooling's fantastic Accelero coolers assumed top-dog position last month. Now we find out Zalman has revamped its flagship GPU cooler, to juice even more performance from its benchmark-proven design. This month the revamped Zalman cooler faces off against Sytrin's KuFormula VF1 Plus—a new addition to the GPU-cooling arena—but the real question is how will this month's developments impact the Acceleros' standing? Let's find out.

—JOSH NOREM



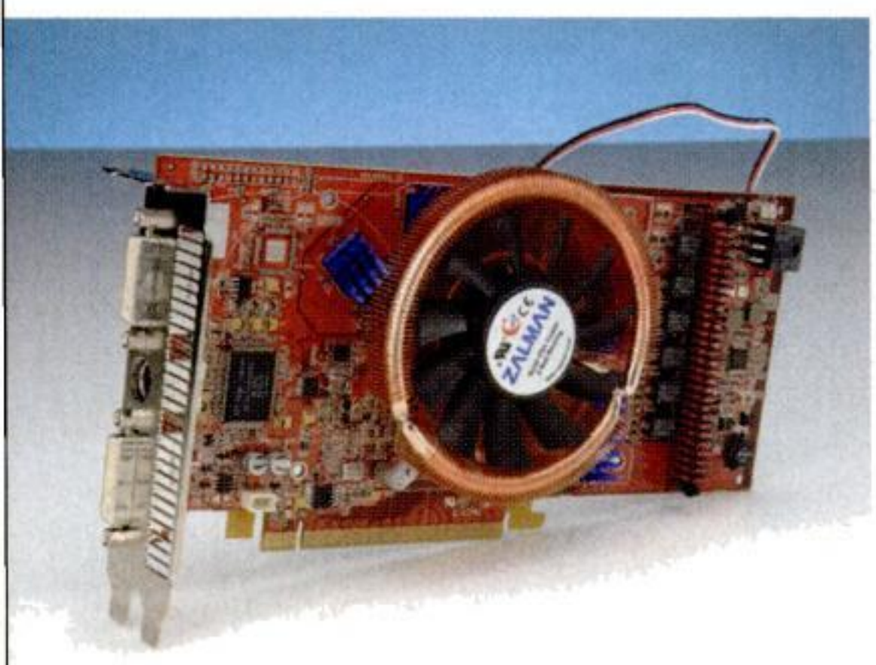
The VF1 Plus features a massive cross-flow fan that's awkward and bulky, but it delivers outstanding cooling performance.

ZALMAN VF900-CU

The VF900-Cu is an evolution of Zalman's previous design, rather than an extreme makeover. While the previous model used a copper base plate with thin copper fins, the new model adds two copper heat pipes to improve heat transfer from the base to the fins. Zalman also changed the way you control fan speed. Previously, you had just two options for fan speed, either slow or fast, which you set by plugging in one of the fan's two power leads. There was no in-between—and the slow mode ran hot and the fast mode was louder than we like. The VF900-Cu includes a knob that's capable of incremental fan-speed adjustments, without having to open the case. It's a far superior method. The VF900 includes the same RAM heatsinks as the previous model, but unlike its predecessor's, these stuck like glue to our videocard's memory.

Installation was incredibly simple, with no tools required. You place the cooler onto the GPU core, and then secure it from the other side with small thumbscrews. During testing, the VF900 did an amazing job cooling our card, with an acceptable amount of noise, even with the fan cranked to the max. It ran 26 C cooler under load than the stock heatsink/fan, which is stunning. Still, the VF900-Cu was 3 C hotter under load than the Accelero and Sytrin coolers.

The VF900-Cu is a fantastic GPU cooler, no doubt. But its nifty adjustable fan isn't enough to topple Accelero's product. After all, you have to adjust the VF900-Cu to its slowest setting for silent operation, while an Accelero is silent without requiring any adjustment.



The new Zalman VF900-Cu has beauty and brawn to spare. Not shown here is its case-mounted fan-speed controller.

ZALMAN VF900-CU

COPPER

Impressively cool; tool-less installation; elegant looks; adjustable fan speed.

ROBBER

Not as cool as its competitors.

9

MAXIMUM PC KICKASS

$50, www.zalmanusa.com

SYTRIN KUFORMULA VF1 PLUS

Sytrin is a newcomer to the cooling scene, and this is the second product we've seen from the company. The first product we sampled was its air-conditioned PC case (reviewed March 2006), which impressed the hell out of us. Sytrin's VF1 Plus GPU cooler is also impressive, although it has a few faults.

Its construction is simple, consisting of a copper base plate with two heat pipes soldered to a gigantic aluminum heatsink. We don't often comment on a heatsink's looks, as they're usually polished and clean, but the grungy, discolored appearance of this one is noteworthy. Compared with the elegant VF900-Cu, well, there's no comparison.

Installation was relatively straightforward, but definitely not the easiest we've experienced. You mount little arms to the copper base plate, place the cooler onto the GPU core, and secure it from the other side with two screws. Eight RAM heatsinks are included, but their low, flat profile doesn't provide much surface area for cooling. At least they adhere to the RAM as well as the Zalman's heatsinks.

Now for the bad news: In order to cool the unit, you have to mount a massive cross-flow fan on top of the videocard. It performs very well, but the fan apparatus is difficult to install. You have to mount the fan to a frame, then push the frame onto the heatsink, ensuring that the parts are perfectly aligned, an exceedingly delicate proposition. The huge fan frame renders this cooler incompatible with SLI. It's loud at full-tilt, but very quiet at low and medium speeds. You can adjust the fan speed, but the included knob is located on a PCI slot cover, where it's tough to access.

This cooler outperformed the Zalman, but its difficult installation and unwieldy design make it much less desirable.

SYTRIN KUFORMULA VF1 PLUS

CROSS-FLOWING

Fantastic performance; affordable.

CROSS-DRESSING

Fan is cumbersome, and it's hard to adjust the fan speed.

7

$36, www.sytrin.com

BENCHMARKS

	VF900-CU	VF1-PLUS	ACCELERO	STOCK HSF
IDLE (C)	46	**43**	46	60
100% LOAD (C)	59	57	**56**	85

Best scores are bolded. Both coolers were tested on an nVidia GeForce 6800 GT. All temperatures were measured via the card's onboard sensor and measured within the Forceware drivers. Fan speeds were set to "high" for testing. Idle temperatures were measured after 30 minutes of inactivity and full-load temps were achieved looping 3DMark06 for one hour.

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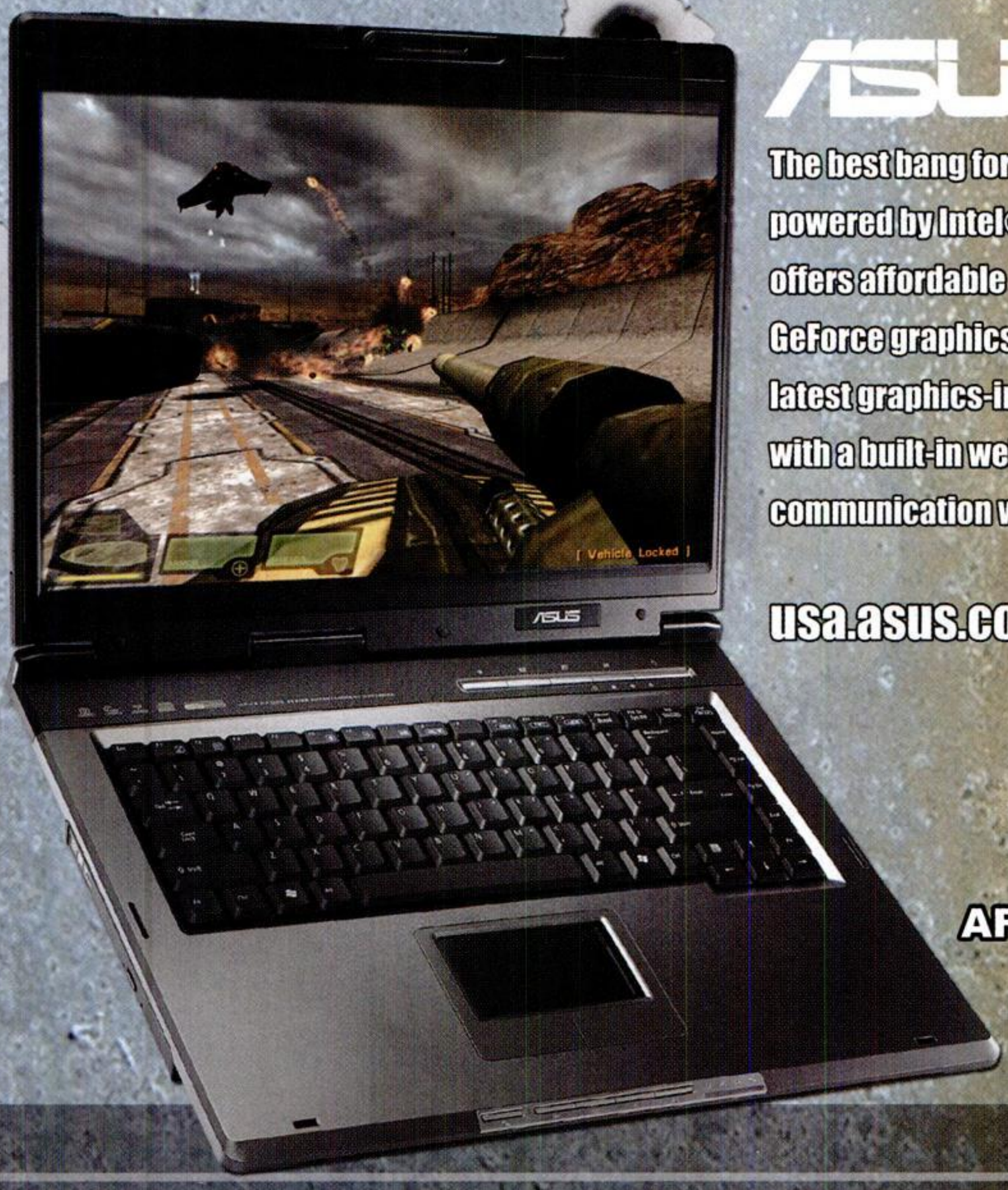

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eVGA e-GeForce 7900 GT CO Superclocked

Meet a midrange monster

eVGA gets aggressive with the GeForce 7900 GT's core and memory clocks.

Can't afford a top-shelf videocard like the screamin' XFX model reviewed on page 72? Take comfort in the knowledge that eVGA has an impressively overclocked version of the only slightly less powerful GeForce 7900 GT: Its $360 street price is $230 lower than the aforementioned 7900 GTX card.

eVGA's main contribution was to factory-overclock the GPU and memory, from 450- and 660MHz, respectively, to 550MHz for the core and 790MHz for the 256MB of GDDR3 memory. But nVidia also deserves a share of the credit for this card's performance. Unlike the 7800 GT, which achieved its cost savings by lopping off four pipes and one vertex shader, the 7900 GT has a full complement of 24 pixel pipelines and eight vertex shaders—just like its more costly cousins, the 7800 and 7900 GTXs.

BENCHMARKS

	EVGA 7900 GT	SLI
QUAKE 4 HIGH QUALITY	59.6	97.0
CALL OF DUTY 2	37.5	58.5
FEAR	39.0	68.0
3DMARK HDR/SM3 NO. 1	13.3	24.3
3DMARK HDR/SM3 NO. 2	18.9	35.1

All scores expressed in frames per second.
Visit www.maximumpc.com/benchmarks for additional details.

As a result, you don't need to sacrifice eye candy in the name of frame rate. Just take a look at the benchmark charts: Running *Quake 4* in High Quality mode, with 4x anti-aliasing, 8x anisotropic filtering, and resolution ratcheted up to 1600x1200, a single card mustered an impressive 59.6 frames per second. The card was even more impressive in our *FEAR* benchmark: At the same resolution, but with soft shadows turned on and AA turned off (a bug in the game dictates enabling one or the other, but not both), eVGA's card came within one frame per second of matching the much more expensive Sapphire Radeon X1900 XTX (also reviewed on page 72).

Things get even more exciting when you bring SLI into the picture. The two cards scaled well running in our new Asus A8N32-SLI Deluxe motherboard, which allows both PCI Express slots to operate in x16 mode: We saw a 60 percent boost in performance running our *Call of Duty 2* benchmark. This is one midrange card we expect to see on our on Best of the Best list for a while.

—MICHAEL BROWN

EVGA GEFORCE 7900 GT — 9
$360, www.evga.com
MAXIMUM PC KICKASS

Western Digital Caviar SE 16 500GB

The new half-terabyte champion, by a nose

Western Digital's new top-of-the-line 500GB drive is just as fast as its 400GB baby brother, and we're OK with that.

This month, WD joins the 500GB party with its Caviar SE 16 drive. Because the 400GB model is already our favorite 7,200rpm drive, we expected big things from its four-platter successor—and we were mostly satisfied.

The drive runs on a SATA 3G interface, sports a 16MB buffer, and uses four 125GB platters. This gives it a substantial areal-density advantage over its 400GB baby brother, which uses four 100GB platters. In drive comparisons, if all other specs are the same, the drive with the higher areal density will always be faster, because the read/write heads can pick up more data with less movement. And, indeed, we see that the 500GB drive has faster read speeds than the 400GB drive, while the performance of the two is essentially equal in all other benchmarks.

BENCHMARKS

	WD400KD	WD5000KS
HD TACH 3		
RANDOM ACCESS TIME (MS)	**13.1**	13.2
BURST RATE (MB/S)	138	**191**
AVG. SEQUENTIAL READ (MB/S)	57	**62.2**
H2BENCHW		
APPLICATION INDEX*	**29.7**	27
OTHER		
DOOM 3 LOADING (SEC)	**30**	31
5GB READ (SEC)	101	**99**
IOMETER 50% RANDOM WORKLOAD (IO/SEC)	**230**	214
OPERATING TEMP (C)	**45**	48

*Best scores are bolded. *The application index is a real-world script of six applications. The score is based on the time it takes the drive to complete the scripts. **Hard drive temperatures measured using S.M.A.R.T. data, as reported by the Speedfan utility.*

The 500GB Western Digital drive set a new benchmark record in *HD Tach*, with an amazing 62MB/s average read speed across its platters. We figured a drive with such awesome read speeds would clean house in our "real world" application index, but it scored lower than its 400GB counterpart. Puzzled, we rang WD and received a second drive for testing, but the score did not change. The application index has always scaled perfectly with drive performance, so we're not sure why the 500GB drive's score is lower.

Compared with the current 7,200rpm champ—WD's 400GB Caviar SE 16—the 500GB version is damn close in performance. We're a little disappointed it's not faster across the board, but the fact that it performs as well as the fastest drive around *and* offers more capacity makes it good enough for us.

—JOSH NOREM

WD CAVIAR SE 16 500GB — 9
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Squeezebox 3

It just keeps getting better

The Squeezebox 3 offers all the same audio-streaming goodness of the Squeezebox 2, but in a sleek, sexy new package.

We've long been fans of Slim Devices' audio-streaming boxes, having praised both the Squeezebox 1 and 2 with Kick Ass awards. So we won't keep you in suspense: We can find no reason not to do the same for the Squeezebox 3.

The guts are basically the same as the previous-generation box, but they're packaged in an elegant brushed-aluminum and black-plastic housing. The gray lens over the 320x32 vacuum fluorescent display renders the text an attractive aqua color, which is even more legible than the Squeezebox 2's green text. And both antennas on the 802.11g wireless version we reviewed are discretely hidden inside the case. Both the wired and wireless models are equipped with 100Mb/s Ethernet ports; and the wireless model can operate as a bridge, enabling Wi-Fi access for other non-wireless Ethernet devices.

On the software front, Slim Devices has added Pandora to its SqueezeNetwork. Pandora's interactive online music service analyzes the artists you like and then automatically plays other music that exhibits similar characteristics. When we told Pandora to create a radio station based on folk singer Guy Clark, for instance, it offered up songs from Clark contemporaries Doc Watson and Townes Van Zandt. No surprises there, but we had to give a thumbs-down to its recommendations of mainstream country crooners Clint Black and Randy Travis. Pandora then responded by streaming songs from Son Volt, Caroline Herring, and several other acts we weren't familiar with, but that we really enjoyed—widening our musical horizons in the process. (Pandora is free for 90 days; a one-year subscription costs $36.)

The Squeezebox 3 uses the same sweet-sounding 24-bit Brown-Burr DAC as the Squeezebox 2, and it offers both analog (RCA) and digital (optical and coax) outputs. Support for WPA Personal and WPA2-AES encryption sets it apart from most competing products, which limit your wireless network to the less-secure WEP. We'd like the Squeezebox 3 even more if it supported subscription music services like Rhapsody natively (there's a third-party plug-in, but it hasn't worked in a year), but it offers so many other features and it sounds so delicious that its one major shortcoming ends up being pretty minor.

—MICHAEL BROWN

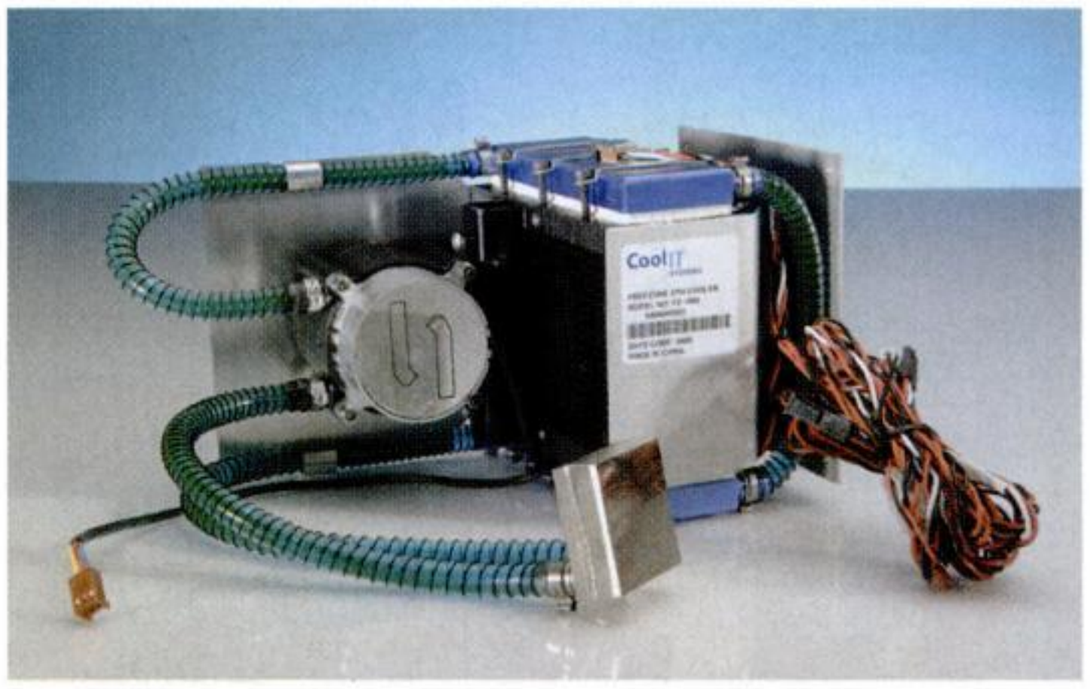
SQUEEZEBOX 3 — 9

$300 (wired: $250), www.slimdevices.com

MAXIMUM PC KICKASS

Coolit Freezone

An interesting concept that falls short



The Freezone looks like a standard water-cooler, but eschews a traditional radiator in favor of six thermoelectric coolers that help chill the water.

We all know that water-cooling delivers more cooling power to the CPU than air-cooling does, but even water-cooling has an Achilles' heel. It can't achieve temperatures below the ambient room temperature. The Coolit Freezone gets around this limitation by using six thermoelectric coolers (TEC), aka Peltier coolers, to chill the water to below room temps. It's a fantastic idea, and it seems like the best CPU cooler ever made, on paper. In practice, however, it's not quite as awesome as we expected.

The factory-sealed unit is similar to Cooler Master's Aquagate Mini. It features a water block that connects to a combination TEC/reservoir/pump. TEC's have a hot side and a cold side. The cold side of the TEC chills the water, and a 9.2cm fan keeps the hot side cool and serves as the unit's mounting point. The unit attaches to either a 12cm or 9.2cm fan mount—it's not compatible with cases that have only 8cm mounts. Motherboard removal is required for LGA775 CPUs, but not for AMD boards (as long as the AMD backplate stays put once you remove the retention bracket). The full-color instructions are exceptional and easy to follow.

During testing, the Freezone delivered the lowest temps we've ever achieved, albeit with considerable noise from the unit's 9.2cm fan. Its idle temp of 21 C exactly matched the ambient temperature of the Lab, and its load temp shot up to 36 C. Its full-load temp and overclocking performance (235MHz) are on par with that achieved by Swiftech's Apex Ultra (reviewed April 2006)—the current king of our water-cooling benchmarks.

BENCHMARKS

	COOLIT	SWIFTECH	STOCK HF
IDLE (C)	**21**	29	40
100% LOAD (C)	**36**	36	54

Best scores are bolded. All temperatures were measured via the onboard sensors, using the utilities provided by the motherboard manufacturer. Idle temperatures were measured after 30 minutes of inactivity and full-load temps were achieved running CPU Burn-in for one hour.

But here's the rub: A temperature delta of 15 C is good, but not impressive (the Apex Ultra boasted a 7 C delta). And what's more, the unit is loud at full-tilt, pumping out 37dBA. You can set it to "quiet" mode, but then temps skyrocket, reaching 57 C under full load. Coolit recommends you set the fan speed somewhere between the two extremes, which we did, but the fan was always audible. It also consumes around 70W of power.

The Freezone is an intriguing product and it works as advertised, but as a CPU-only cooler it's very expensive at $400, a bit noisy, and a smidge underwhelming.

—JOSH NOREM

COOLIT FREEZONE — 7

$400, www.coolitsystems.com

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iPod Accessory Assemblage

Everyone wants to hook up with your iPod

The staggering success of Apple's iPod has spawned a torrent of add-on gadgets, ranging from pint-size speakers to docking stations adorned with more bells, whistles, and tassels than a Shriners parade. Here's a look at three of the latest.

—MICHAEL BROWN

ALTEC LANSING INMOTION IM11

Altec Lansing's inMotion iM11 is an even smaller portable speaker/docking station than the iM5 model we reviewed in January—and we like it just a bit more than its portlier sibling.

Although the iM11 doesn't have a video output, like the iM5, it also doesn't have that higher-priced model's propensity to distort at higher volumes. Frankly, we were surprised at the quality of sound the iM11's wee speakers managed to produce: It won't blow your hair back, but it's a good near-field audio system.

The iM11 runs on either four AA batteries or AC power, charging a docked iPod while operating on the latter. Plug it into your PC's USB port and it will sync to your *iTunes* account. Adapters render the system compatible with any iPod that has the Dock connector. Any other portable music device can be plugged into an auxiliary audio input.

When you're not using the speakers, they fold into a compact package that can be stored in the included padded carrying case, with ample room left over.

Altec Lansing's iM11 portable speaker/dock for iPod weighs just 14 ounces.

ALTEC LANSING INMOTION IM11

+ SPEAKERS
Good sound from a small, portable package.

– LEAKERS
For a 100 bucks, it should have a video output.

8

$100, www.alteclansing.com

KENSINGTON ENTERTAINMENT DOCK 500 FOR IPOD

The iPod would be much easier to use if Apple allowed the device's GUI to be output to an external video display. The remote control accompanying Kensington's Entertainment Dock 500, however, makes it easy to navigate the player's menus from afar.

What looks like a familiar control wheel on the remote is a fake-out: It's really just a thin layer of plastic covering the primary function buttons. These light up when pressed, but the other three buttons don't. Maybe Kensington figured you'd have to cozy up to the iPod before you could read its screen anyway, so you could rely on *its* illumination.

The docking station itself is compatible with every iPod except the Shuffle, charging the player while docked. Kensington wisely provides both composite and S-Video outputs. The one feature Kensington missed—an omission that cost this product a Kick Ass award—is a USB port, so you could sync the iPod to your PC while it's docked.

Kensington's remote control uses a radio frequency, so there's no line-of-sight requirement.

Logitech's Wireless Music System for iPod will stream music from any device equipped with a headphone output.

KENSINGTON DOCK 500 FOR IPOD

+ DOCK OF THE BAY
Great remote control; attractive industrial design.

– CROCK OF THE BAY
Won't sync your iPod while docked.

9

$100, www.us.kensington.com

LOGITECH WIRELESS MUSIC SYSTEM FOR IPOD

Logitech's Wireless Music System for iPod will turn *any* MP3 player into a wireless music-streaming device, and it sounds fantastic.

The system consists of two components: a Bluetooth transmitter that plugs into your player's headphone output, and a receiver that connects to your hi-fi system or self-powered speakers. The transmitter has its own rechargeable battery, so it doesn't leach off your player's; the receiver is AC powered.

One transmitter can be paired with up to 10 receivers, but it can stream to only one at a time. A button push switches the transmitter to the closest receiver/speaker combo. Stand-alone receivers sell for $80 each, and the transmitter is compatible with Logitech's nearly identical Wireless Music System for PC.

Wireless coverage was excellent—we had no problems achieving the promised 33-foot range. Hats off to Logitech for adapting Bluetooth wireless technology so well.

LOGITECH WIRELESS FOR IPOD

+ BLUETOOTH
Excellent audio quality; system is expandable.

– BLACK TOOTH
Streams to only one receiver at a time.

9

MAXIMUM PC KICKASS

$150, www.logitech.com

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Condemned: Criminal Origins

Starts with a bang, ends with a whimper

We're about to introduce this guy's skull to our lead pipe. *Condemned's* brutal melee combat is some of the best we've ever experienced, although the lack of variety gets tiresome.

***Condemned: Criminal Origins* is one of the creepiest single-player games we've ever played. It's even scarier than *FEAR*, which is the current high-water mark in the horror/shooter genre. But like *Doom 3*, it runs out of new ideas early, and by the end of the game it's not scary anymore, just tedious.**

You play a forensic specialist in the game, and you're on the trail of a serial killer. Not surprisingly, this serial killer hangs out in disgusting, decrepit buildings, which you must scour for clues. And naturally, these buildings are filled with drug-crazed people who want to kill you, while you're completely unarmed (you're a scientist, after all). You have to cull your weapons from the environment. You can pull conduit off walls, rip rebar from support structures, yank out steam pipes, or pull down signs. Grab your blunt object, and then use it to bash in the brains of your attackers. Sometimes, if you beat a lunatic so hard that he's almost dead, he'll fall down on his knees in a stupor, giving you the opportunity to perform one of four dazzling finishing moves.

Occasionally, you'll find a loaded pistol or shotgun lying around, which seems like the answer to your prayers, until you pick it up and realize there are only a few bullets left in it. Because you can carry only one weapon at a time, it's unwise to swap a good melee weapon, such as a fire axe or sledgehammer, for a gun that will run dry after fighting just one or two people.

Each level has nine hidden objects for you to find: six bird carcasses and three metal objects. Finding all of the objects is very difficult, but once you do, you are rewarded with the lamest prize ever—unlocked photos of concept art from the game. B-O-R-I-N-G. Once we realized that this was all we'd get, we stopped wasting our time searching for the hidden secrets.

There's no multiplayer, and there's not much replayability, either. Our advice: Wait until this game hits the bargain bin; then it'll be a must-buy.

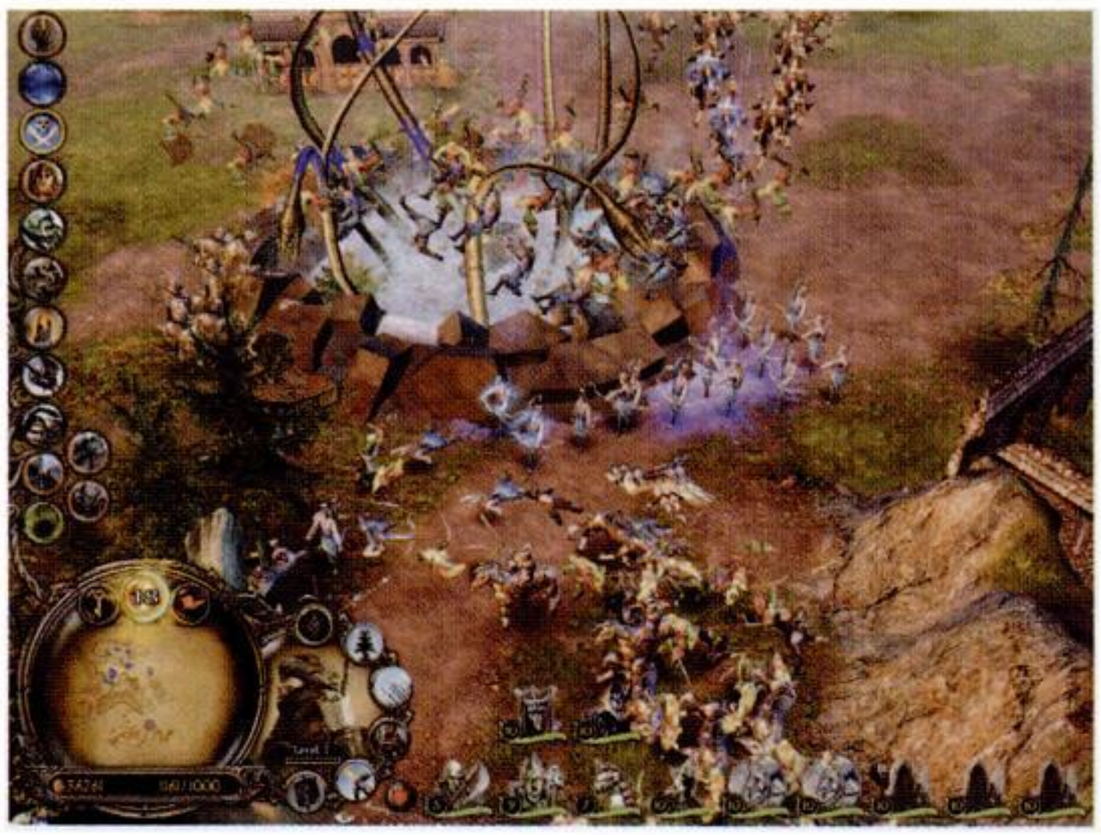
—JOSH NOREM

CONDEMNED: CRIMINAL ORIGINS **7**

$40, www.condemnedgame.com, ESRB: M

The Lord of the Rings: The Battle for Middle Earth II

The second time around the RTS block is a charm



Placing a Watcher in the Water amid a massive force of defending do-gooders and watching the carnage erupt makes being evil lots o' fun.

If you're looking for a sophisticated RTS that innovates and really pushes the genre forward, *The Battle for Middle-Earth II* is definitely not for you. *BFME II* does away with the often tedious resource-harvesting and unit-and-building micromanagement mechanics found in most RTS games. You're limited to just a few building and unit types per mission (though all can be upgraded) and a very basic suite of orders that you can issue to your minions.

That said, what this game does really well is deliver the massive, brutal feel of the epic battles in the films and books. From the start of just about every mission you will be faced with combat—no sitting back and harvesting resources and building a massive army here. You will need to defend against probing raiding parties that grow increasingly powerful—while sending out your own patrols to establish and defend resource points and pinpoint the enemy's. Your goal is the typical "find the enemy base and eradicate it from the map" variety, which is more exciting than it sounds. In one massive battle, we destroyed more than 10,000 enemy units before securing victory—*10,000 units!* What the AI lacks in craftiness, it more than makes up for with overwhelming numbers, and it will have you on your heels often.

The good and evil single-player campaigns are entertaining and just challenging enough. The new turn-based War of the Ring mode brings a nice Risk-style twist to the multiplayer action, too—allowing you to avoid real-time combat and play an entire game at the tactical level, if you wish.

We'd like to have a much greater level of control over the camera zoom (it's tough to get a good view of large battles and to control flying units), and a bit more sophistication from the AI. But if you want an RTS that does justice to not only Tolkien's books, but also Jackson's trilogy of films, with stellar graphics, sound, pyrotechnics, and an adrenaline-pumping level of nonstop, absorbing action, this sequel deserves your attention.

—STEVE KLETT

LOTR: BFME II **8**

$50, www.ea.com, ESRB: T

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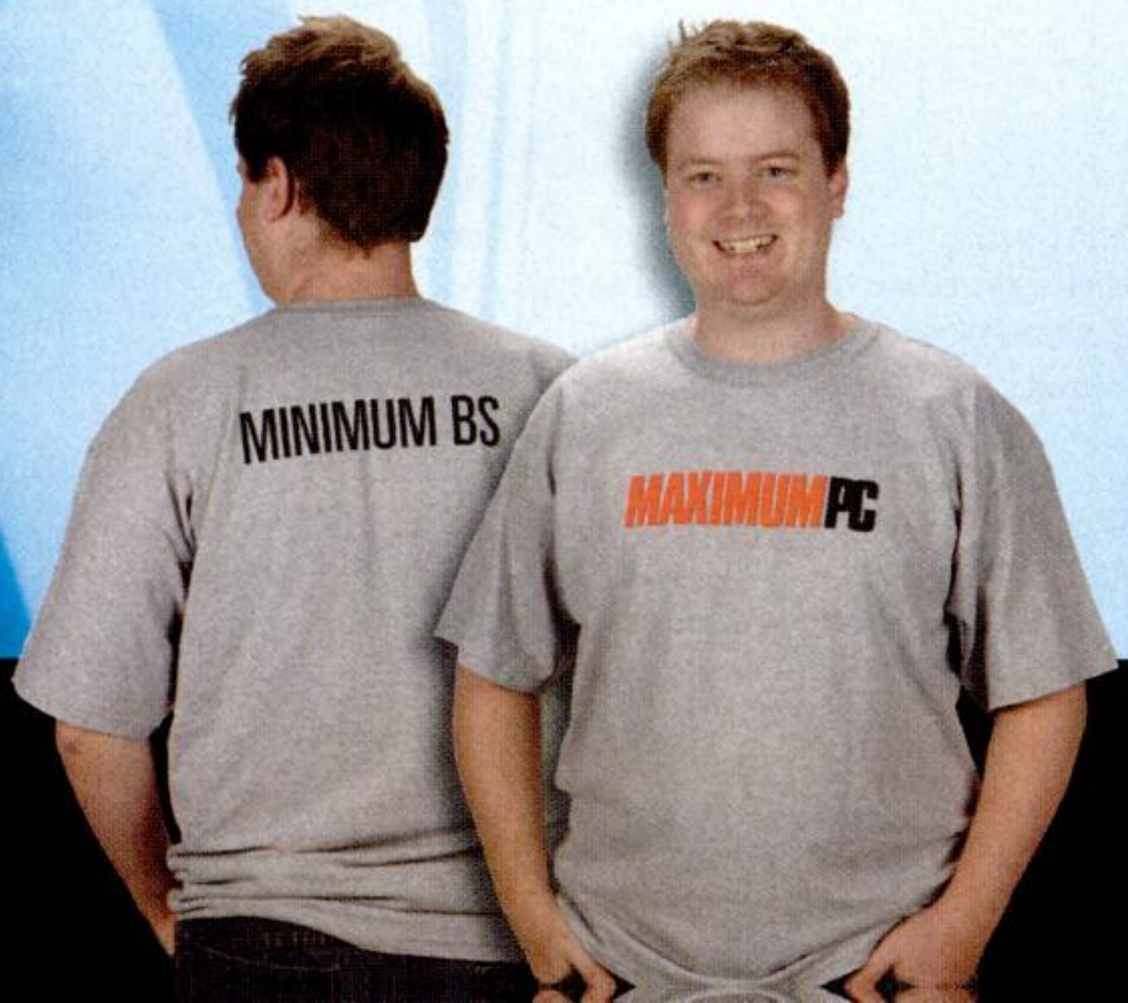

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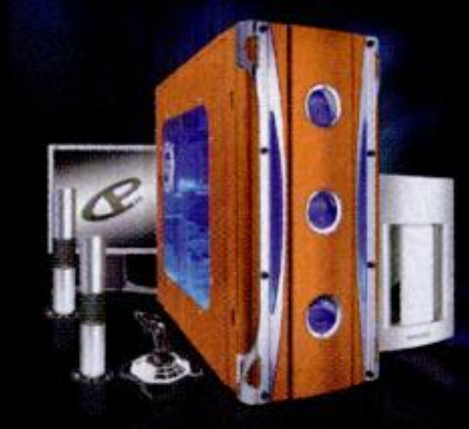

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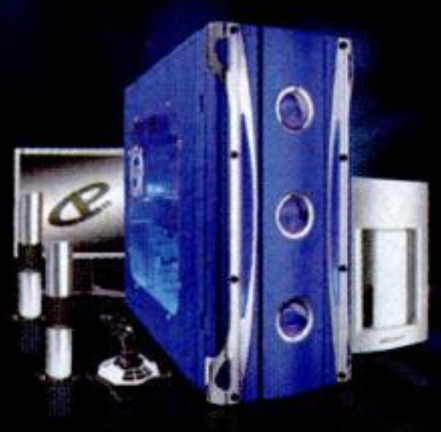

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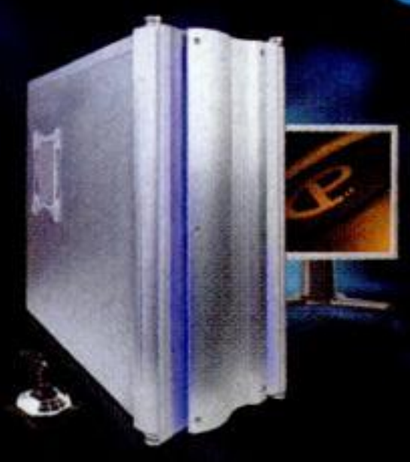

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AMD Athlon™ 64 X2 4400+ Processor	$ 1595
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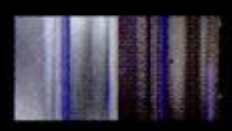

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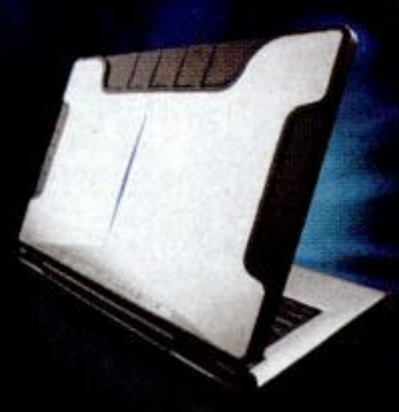

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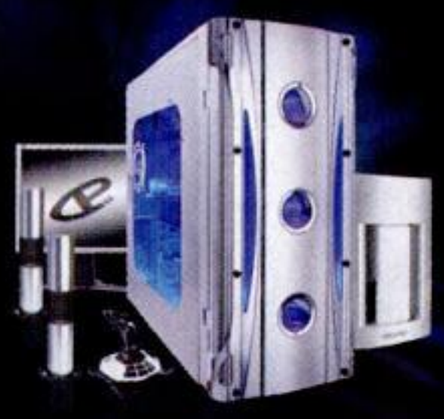

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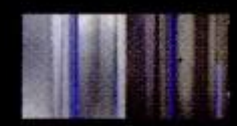

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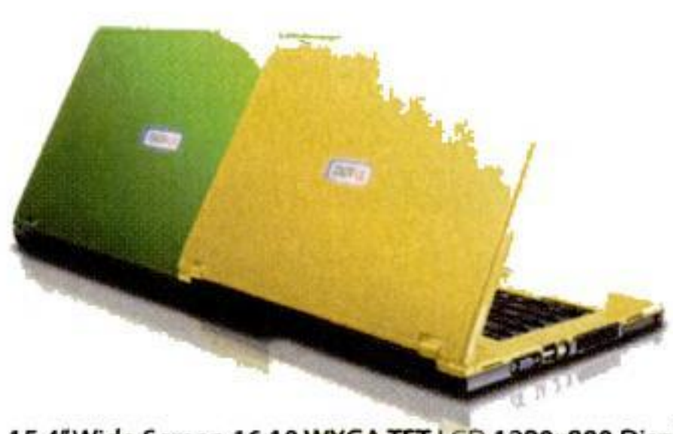

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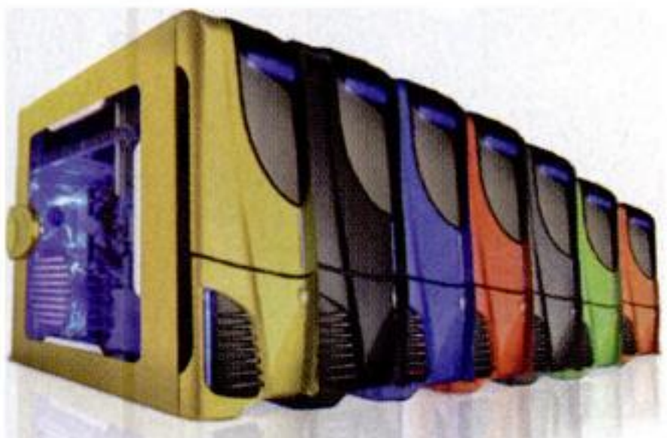

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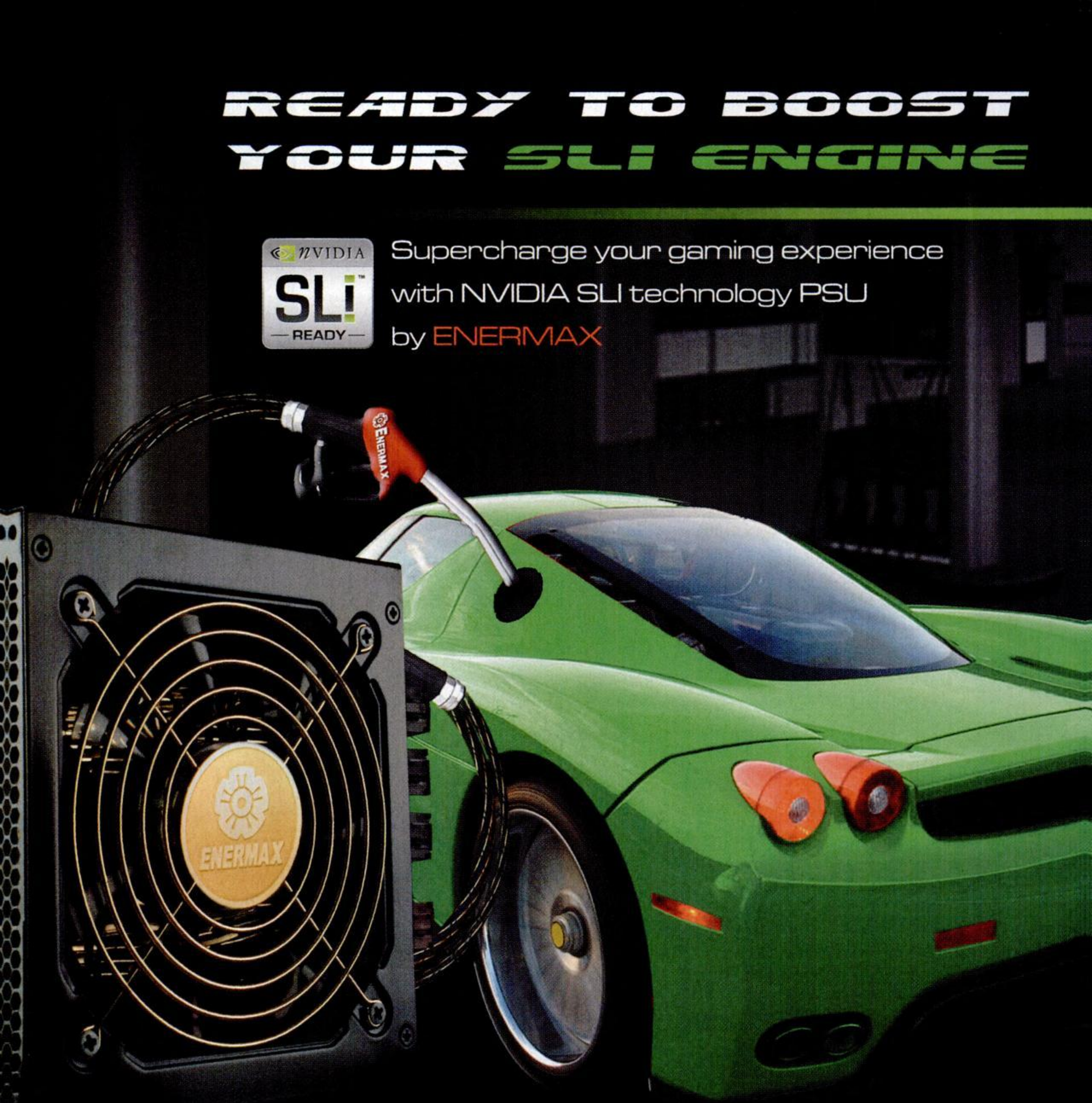

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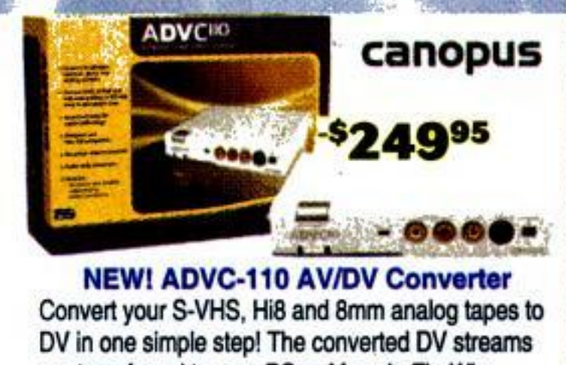

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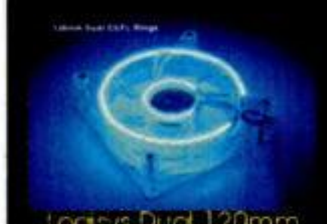
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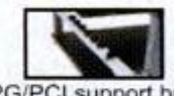
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The judges will be *Maximum PC* editors, and they will base their decision on the following criteria: creativity and craftsmanship.

ONE ENTRY PER HOUSEHOLD. Your contest entry will be valid until (1) six months after its submission or (2) October 15, 2006, whichever date is earlier. Each month a winner will be chosen from the existing pool of valid entries, and featured in the Rig of the Month department of the magazine. The final winner in this contest will be announced in the January 2007 issue. Each of the judging criteria (creativity and craftsmanship) will be weighed equally at 50 percent. By entering this contest you agree that Future US, Inc. may use your name and your mod's likeness for promotional purposes without further payment. All prizes will be awarded and no minimum number of entries is required. Prizes won by minors will be awarded to their parents or legal guardians. Future US, Inc. is not responsible for damages or expenses that the winners might incur as a result of the Contest or the receipt of a prize, and winners are responsible for income taxes based on the value of the prize received. A list of winners may also be obtained by sending a stamped, self-addressed envelope to Future US, Inc. c/o Maximum PC Rig of the Month, 4000 Shoreline Ct, Suite 400, South San Francisco, CA 94080. This contest is limited to residents of the United States. No purchase necessary; void in Arizona, Maryland, Vermont, Puerto Rico, and where prohibited by law.

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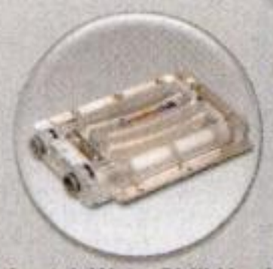

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We tackle tough reader questions on...

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BAD BOOT

Regarding the "Fastest Boot in the West" article in the May issue, I applied all the techniques without any problems and was very pleased with the results, except one. Removing the XP splash screen (/NOGUIBOOT) added several seconds to my boot time. Is it just me, or is it Bill Gates' way of sticking it to the end user?

—Dave Buyna

SENIOR EDITOR JOSH NOREM RESPONDS: Windows XP's boot sequence is a mysterious, confounding process. Because the /noguiboot switch removes the visual part of the boot process, thereby reducing, albeit slightly, the demands made upon your system, it should result in a slightly faster boot. Indeed, it saved us an extra two seconds. As for why you didn't get the same results, we don't know. Perhaps your Windows installation is more bloated than the one we used for testing. Maybe you have different hardware. Maybe you've been naughty and Bill Gates found out. Our advice is to turn the GUI back on if you want those seconds returned. And then the next time you reinstall Windows, try turning it off to see if you achieve some gains with a fresh install.

DON'T BE GREEN WITH ENVY!

I think you missed a VERY important feature of the Creative Zen Vision: M review when comparing it to the fifth-gen iPod (May 2006)—the number of colors each screen renders. True, the iPod has the kick-ass interface, more capacity, a smaller size, all kinds of crazy third-party support for add-on devices, the list goes on. But the iPod's 65K color screen pales in comparison to the Vision: M's 262,144 colors.

When every portable media player that comes out is compared to some flavor of iPod, the other guys need a little help. I still agree with the score you gave the Vision: M, considering the lackluster controls, but I know that screen would sway some consumers.

—Defiler

EXECUTIVE EDITOR MICHAEL BROWN RESPONDS: When a product dominates its market segment the way the iPod rules the media-player market, we'd be remiss to not compare it to every new challenger. But when it comes to settling on a verdict, hands-on test-

Easy to Install, My Ass!

You must have been smoking something when you gave the Cooler Master Hyper 6+ a Kick Ass award and proclaimed it easy to install (Sept. 2005).

First off, I had to remove the motherboard and stock retention plate. Then the screws on my Asus A8N-SLI Premium weren't long enough to reach through the motherboard, so I had to bend the arms on the front retention plate. After getting the nuts attached and tightened, I found that the rubber grommets provided for the front retention plate don't tighten against the motherboard. Easy installation? I don't think so.

Then I got it installed and found that only a four-pin plug is provided, which will fit on my three-pin Asus motherboard, but then the fan will only run at the lowest speed. Cooler Master's installation instructions were awful. Its tech support is almost nonexistent. I'm not calling a 900 number for tech support, and my emails haven't been answered. I almost forgot: The provided fan is 10cm—try finding a replacement for that. Are you sure you really tested this CPU cooler? I for one will never buy another Cooler Master product.

—Tom Simon

save you time, energy, and money. Although we've received a lot of letters from people who love the Hyper 6+, it disturbs us to hear that you didn't get along with yours.

In our defense, the Hyper 6+ *is* easy to install compared to some of the other "big boned" CPU coolers on the market. That said, if your motherboard has a backplate that's glued on, then yes, it's a more difficult process. As far as the arms not reaching, you just need to push a bit harder. We've installed our Hyper 6+ many times, and though it's a tough fit, the arms have always reached all the way through the board.

We'll admit that we're not fans of motherboard removal though, especially when coolers from Arctic Cooling and Zalman perform just as well without requiring you to rip any core components from your case. If we reviewed the Hyper 6+ today, we might knock a point from its score, but the cooler is still worthy of the Kick Ass award. If you want to ditch yours for good, go with Zalman's CNPS9500 LED. It fits a wide array of socket types, has adjustable fan speed, and cools as well as the Hyper 6+.

SENIOR EDITOR JOSH NOREM RESPONDS: Sounds like you had a pretty bad experience. Tom; and that's never good to hear. We test products thoroughly and recommend what we think is the best, in order to

CUTCOPYPASTE

In the May issue How2 department, we advised readers to go to **www.itv.com** for downloadable TV content, but the correct URL is actually **http://wwitv.com**.

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ing of a product carries 10 times more weight than any spec chart. And in a head-to-head comparison of the Vision: M and the iPod, we just couldn't discern much difference between the two players' video or audio attributes.

I BEG TO DIS-OGG-REE

The answer you gave for question 23 in your May 2006 Geek Quiz is incorrect. According to the OGG FAQ at ***www.vorbis.com****, OGG is a lossy codec, albeit a very high-quality one.*

—Gregor Diseth

EXECUTIVE EDITOR MICHAEL BROWN RESPONDS: Actually, we're both wrong, Gregor. According to the OGG Vorbis FAQ, OGG is a container format for audio, video, and metadata. Vorbis is the codec that's most commonly contained in OGG files, but OGGs can also harbor other codecs, including FLAC. And this means question 23 is thoroughly ambiguous. Damn, now the College Board will never hire me to formulate questions for the SAT!

TUBING TRICK

I read your review of the Swiftech Apex Ultra in the April 2006 issue, and noted your difficulty in installing tubing over the barbs on the water pump. I thought that I might share an old lab trick for installing polyethylene tubing. Immerse about an inch of the end of the tubing in boiling water for 15 seconds or so, and then immediately slip it over the barb. Don't tighten the retaining clamp until the tubing cools, however, or the clamp will "bite" into the tubing. I've used this trick for years, to attach tubing to condensers. It makes a very strong, watertight connection. The only hitch is that the connection is so strong that if you ever need to remove it, you have to cut the tubing from the barb with a razor blade.

—Russell T. Garland, M.D.

SENIOR EDITOR JOSH NOREM RESPONDS: Thanks for the tip, Russell. Several readers wrote to us to about the boiling water trick, and to be perfectly honest, we were not aware of it before now. I'm sure other water-cooling aficionados will appreciate it as much as I do.

WESTERN DIGITAL WTF

I'm shopping for a new hard drive, and I noticed you've been recommending the Western Digital Caviar 400GB SATA drive with 16MB cache. But while shopping I've seen two different models.

You recommend the WD400KD model, but I've also seen the WD400YR model. What's the difference? The only difference I'm aware of is that one of these is intended for RAID arrays, but I've never heard that a special model of drive is required for RAID, unless there's something weird about SATA that needs it. This will be my first SATA drive, and I have no intentions of using RAID.

Please help me clear up the differences with KD and YR models. Which is better, or does it matter if I'm not going to use RAID? Should I get the slightly cheaper YR model? Also, has WD made a 500GB model with 16MB cache buffer, with the same or better performance as the 400GB version?

—Monty A. G.

SENIOR EDITOR JOSH NOREM RESPONDS: Western Digital's model-name smorgasbord is a bit confusing, so let us clear it up for you. The "K" at the end of any WD drive means it's for desktop use, as opposed to enterprise usage, and that it has a 16MB buffer. The "D" means it uses a SATA 150 interface, whereas "S" means it uses a SATA 3G interface. So the 4000KD is a desktop drive with a 16MB buffer that rides the SATA 150 interface. There's also a 4000KS drive which—you guessed it—has a 16MB buffer and a SATA 3G interface.

"YR" signifies a Raid Edition, or RE, drive. It's designed for enterprise applications, and as such it's different from the K drives in three ways. First, it has native command queuing (NCQ), which lets the drive collect a queue of data requests and then execute them in the order the drive deems most efficient (depending on where its read/write heads are positioned when the requests are received).

Second, enterprise drives (YR) are tested more stringently than desktop drives, and are tested nonstop for a prolonged period, which WD calls 100-percent duty cycle. These drives have a higher mean time between failure (MTBF) than WD's desktop drives. WD says the MTBF for RE drives is currently 1.2 million hours, but it doesn't release the MTBF for desktop drives, so it's impossible to compare the two. WD did say the desktop MTBF is lower though, which is expected.

Third, YR drives have a longer warranty. All enterprise drives from WD come with a five-year warranty, while desktop drives have a three-year warranty.

And finally, regarding your question about the 500GB version, the answer is yes. We reviewed the new WD5000KS this month on page 78. It's a very fast drive and our new favorite 7,200rpm desktop model. MPC

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Maximum PC goes undercover and investigates all of the online music services. Which are crippled by DRM? Which have the best rates? Which one is right for you? Find out next month!

SILENCE YOUR HARD DRIVES!

Hard-mounted hard drives transmit loud and annoying vibrations to your case. We'll show you how to silence your drives by suspending them in elastic webs. It's so crazy, it just might work!

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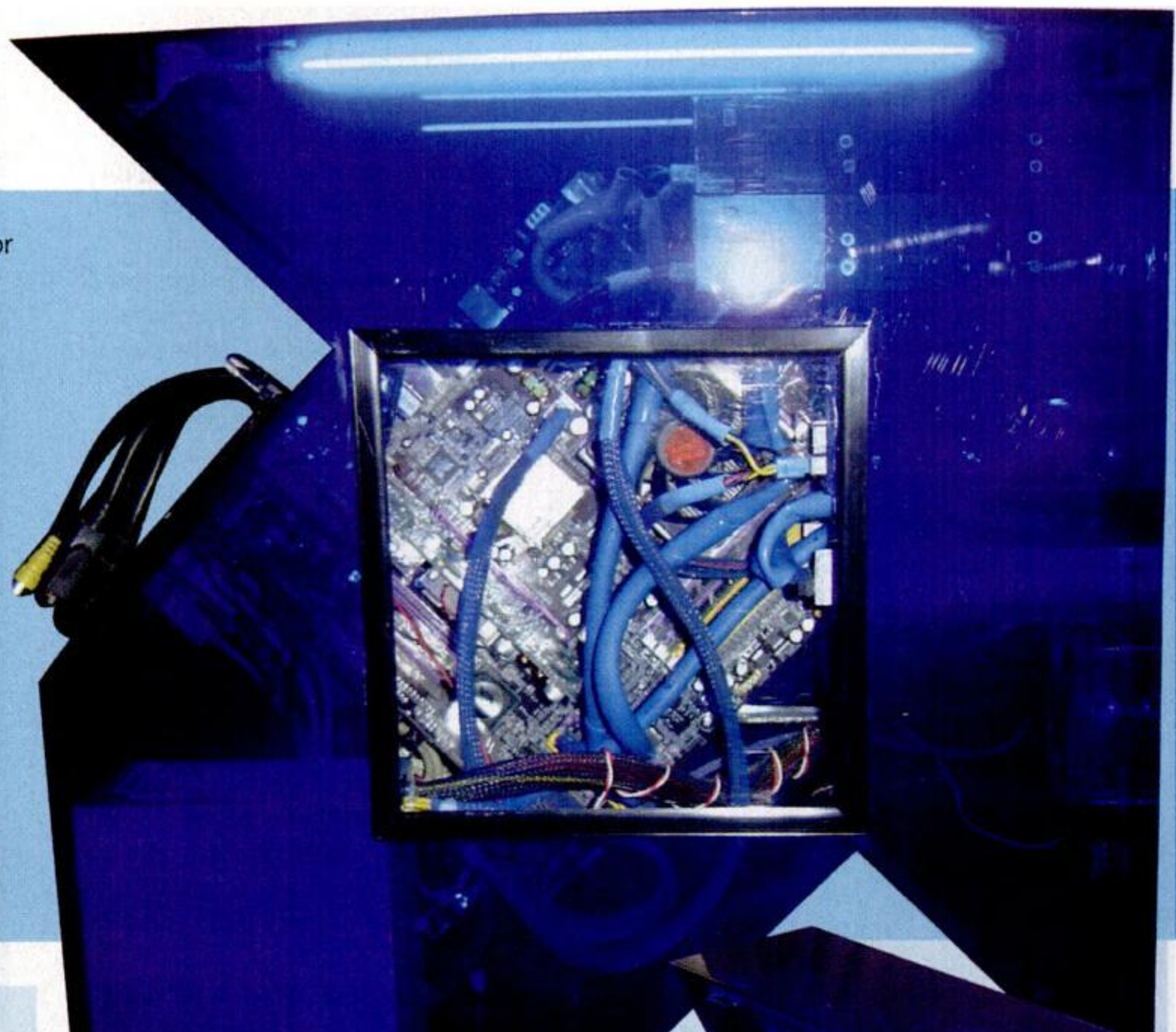
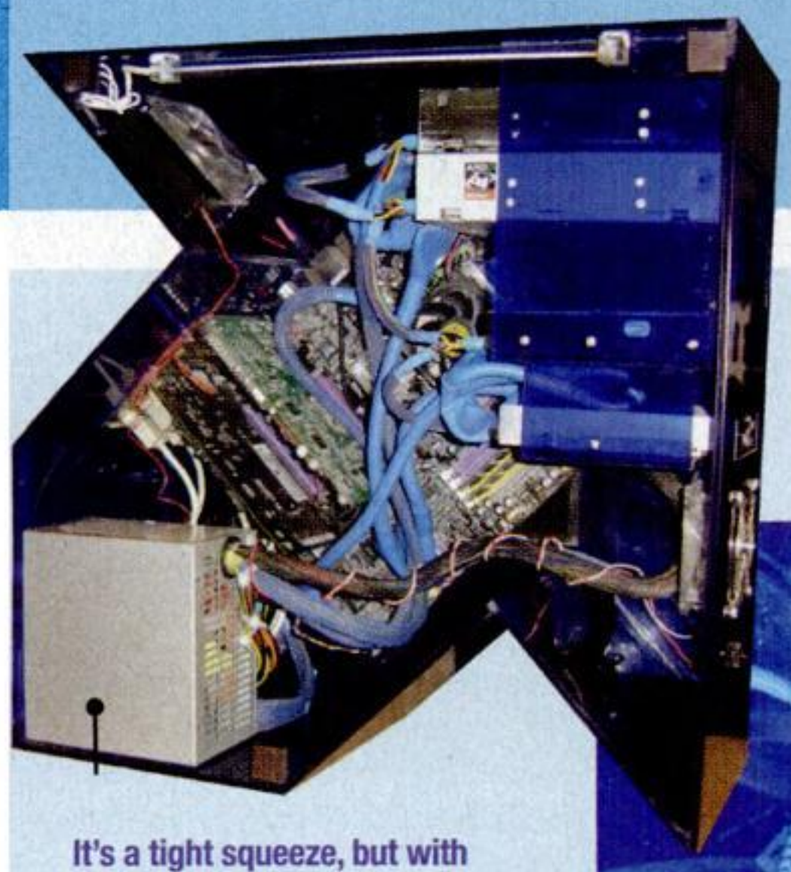
PAUL GUNNELS'

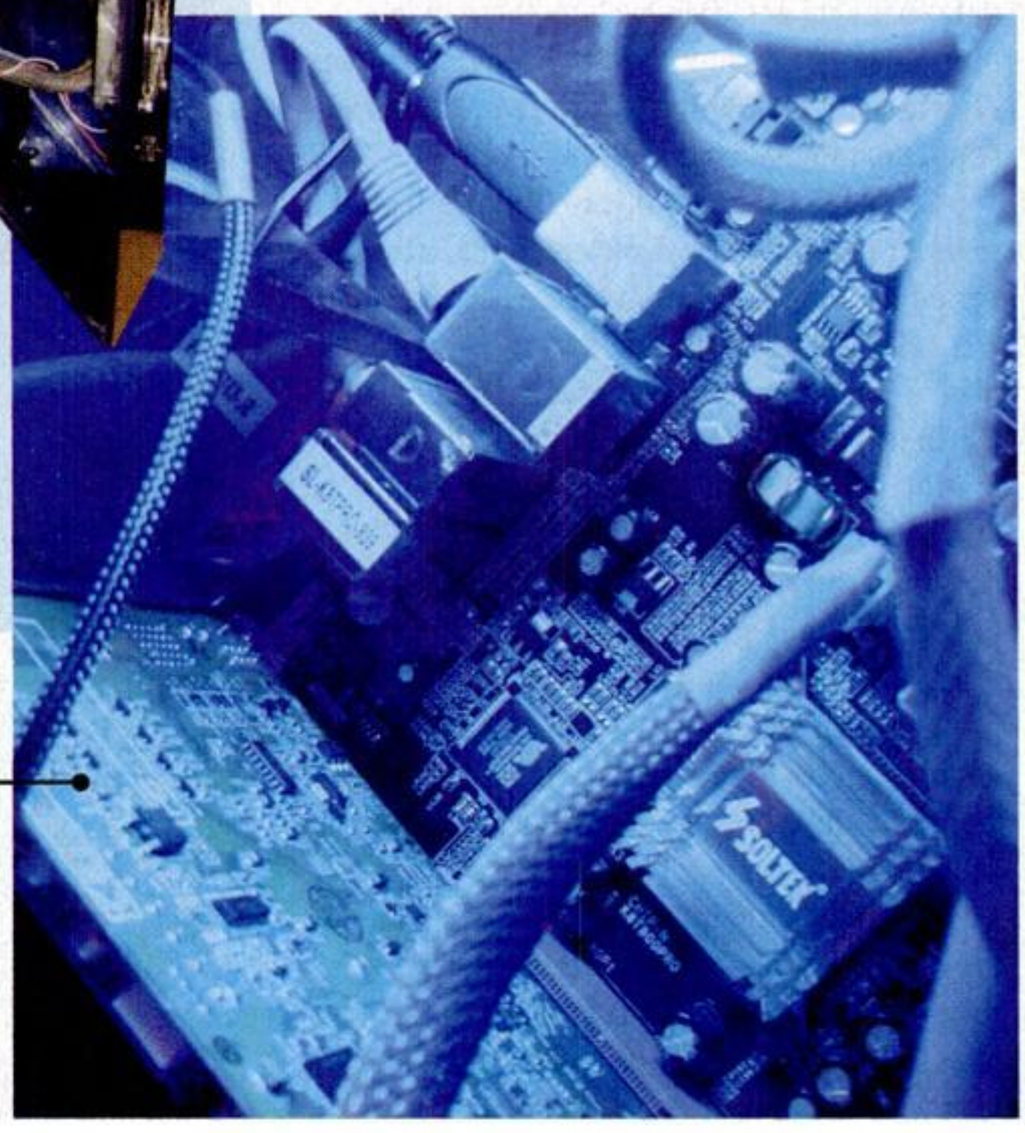
AMD Case

CPU-maker AMD has long been known for its fervent followers. Indeed, you might say that Paul Gunnels' rig is the power-user equivalent of a sports-fanatic's face paint (though much more socially acceptable, in our opinion). Don't let the simplicity of the logo fool you. Gunnels had to do some serious planning and careful construction to maintain the original's proportions *and* cram the oddly shaped case with a full complement of computer parts. It helped that he made a foam model before committing his design to 1/4–inch acrylic, but it was pure luck that the finished rig could accommodate his last-minute component changes.

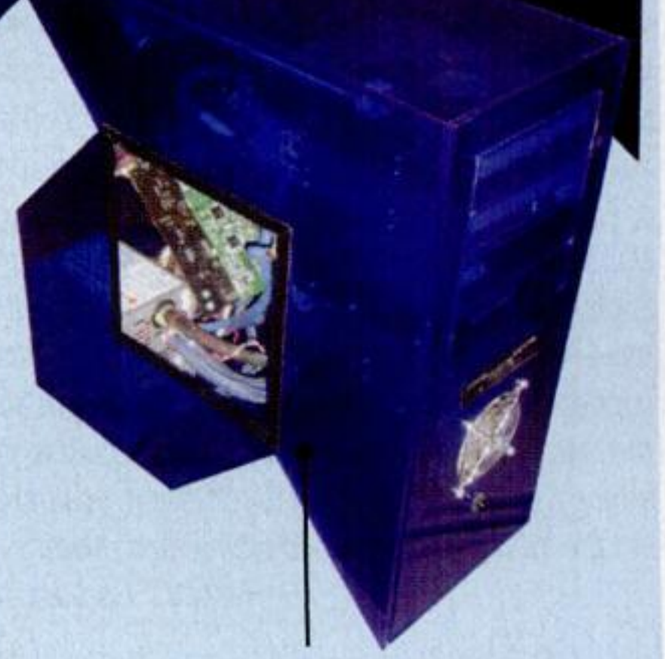




It's a tight squeeze, but with the mobo set at an angle, and the PSU turned onto its side, Gunnels has just enough clearance between the drives, CPU fan, and RAM.



Obviously, there are limitations to the design. Gunnels isn't a gamer, so he'll survive without a second videocard, but restrictions on aftermarket cooling could curtail his overclocking adventures.



With the help of an *AutoCAD* diagram and a laser cutter, Gunnels turned a 5x5-foot sheet of blue acrylic into 10 large pieces for the case, along with smaller parts for a drive cage and stealthed drive bezels. Gluing it all together took a good couple weeks.

For his winning entry, Paul Gunnels wins a $500 gift certificate for TigerDirect to fund his modding madness! See all the hardware deals at www.tigerdirect.com, and turn to page 100 for contest rules.

If you have a contender for Rig of the Month, e-mail **rig@maximumpc.com** with high-res digital pics and a 300-word write-up.

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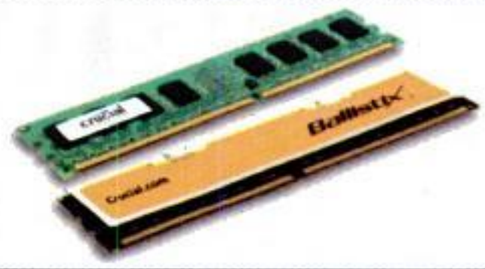

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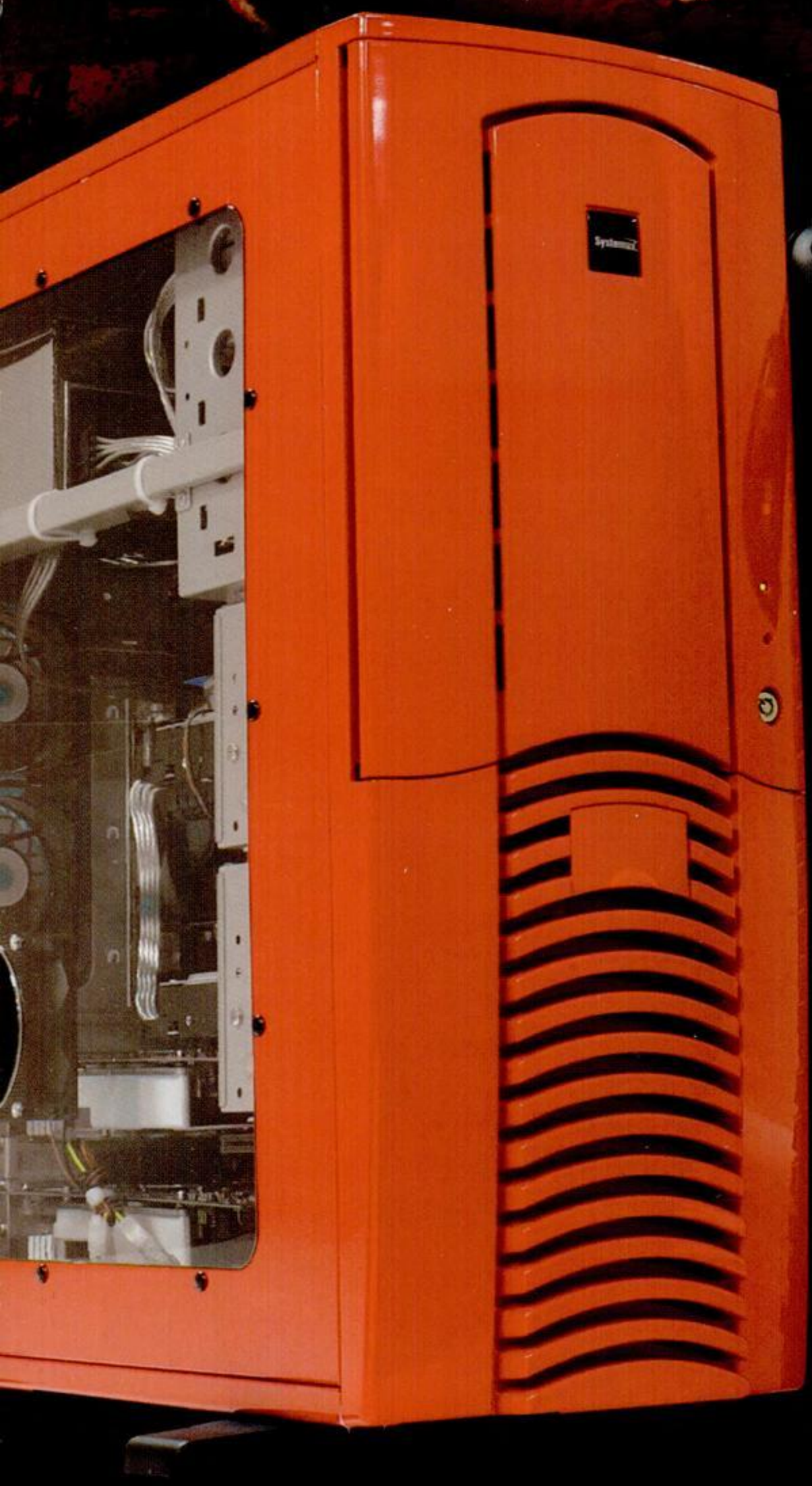

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